Unit 103: Introduction to the built environment life cycle

# Sample scheme of work

This sample scheme of work covers classroom-based learning for   
Unit 103. It is based on 3 hours per session for 18 sessions. It is an example only of a possible scheme of work and is based on theory within an FE centre, but can be amended to suit all learning facilities with the necessary adjustments to meet individual learners’ needs.

**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 have/need additional learning time.**

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
* Essential Skills (Application of Number, Communication, Digital Literacy and Employability)
* extension tasks and differentiation, inclusion, entitlement and equality issues
* spiritual, moral, social and cultural issues
* environmental education and related European issues
* British Values
* use of information learning technology (ILT).

Unit 103: Introduction to the built environment life cycle

# Sample scheme of work

**Course/qualification:** Foundation in Construction and Building Services Engineering **Tutor’s name:** Enter the tutor’s name here

**Number of sessions**:18 **Delivery hours**: 55 **Venue**:Enter the venue here **Group**: Enter the group here

|  |
| --- |
| **Learning outcomes**   1. Understand the design of buildings and structures 2. Know the planning process 3. Understand the stages of construction and the installation of services 4. Know the methods of promoting the services offered within the construction and built environment sector 5. Know types of and purposes of maintenance of buildings, structures and installed services 6. Understand repurposing of buildings and structures 7. Know the process for demolition and destruction of buildings and structures |

| Session | Objectives/learning outcomes **The learner will:** | Activities and resources | Skills check |
| --- | --- | --- | --- |
| 1  3 hours | 1. **Understand the design of buildings and structures**   1.1 Surveying | Activities:   * Introduction to unit and expected outcomes. * Facilitate classroom discussion. * Deliver PowerPoint 1 and introduce learners to the different purposes of surveying and the importance of accurate measuring. * Check learner understanding of the basic principles of surveying and definitions of: transferring levels and datums, chain surveying, compass surveying, ordnance survey benchmarks, temporary benchmarks. * Discuss the evolution of surveying equipment, exploring the use of theodolites, staffs, compasses, automatic levels, lasers and scanners. * If possible, display equipment and carry out basic levelling exercises in workshop or field. Use laser measuring equipment to calculate areas and volumes of classrooms and workshops.   Resources:   * **PowerPoint 1: Know the design of buildings and structures** * **Worksheet 1: Surveying** | Oral questioning  **Worksheet 1**  Feedback on Worksheet 1 |
| 2  3 hours | 1. **Understand the design of buildings and structures**   1.2 The environmental considerations that impact on construction | Activities:   * Facilitate classroom discussion. Debate the importance of protecting the environment from work activities. * Discuss local, national and international events, i.e. the Amoco Cadiz or Exxon Valdez oil spill or air pollution from steel works, e.g. how Port Talbot is the ninth most polluted city in the UK. * Deliver PowerPoint 2 and introduce learners to precautionary and preventative measures, rectifying at source, integrations within the environment and the ‘polluter pays’ principle.   Resources:   * **PowerPoint 1:** **Know the design of buildings and structures** * **Worksheet 2:** **Polluter pays policy** * Webpage: <https://gov.wales/sites/default/files/consultations/2019-03/eu-exit-consultation-document_0.pdf> | Oral questioning    **Worksheet 2**  Feedback on Worksheet 2 |
| 3  3 hours | 1. **Understand the design of buildings and structures**   1.3 Sustainability | Activities:   * Deliver PowerPoint 1 and introduce the principles and importance of sustainability. * Class discussion on the impact of sustainable and non-sustainable practices. Debate how thoughtful planning using commercially available materials can aid in reducing waste, speeding up production, reducing costs and increasing profits. * Debate how the use of natural resources can be reduced by improved design, use of insulation and water harvesting. * Introduce a range of renewable energy sources that reduce running costs while protecting natural resources. * Learners to look online to research sustainable insulation materials.   Resources:   * **PowerPoint 1:** **Know the design of buildings and structures** * **Worksheet 3: Sustainability** * Websites to research sustainable insulation materials: * <https://woodfibreinsulation.co.uk/homepage/nature-pro/> * [www.kingspaninsulation.co.uk/Sustainability.aspx](http://www.kingspaninsulation.co.uk/Sustainability.aspx) * [http://insulation.sustainablesources.com](http://insulation.sustainablesources.com/%20) * [www.superhomes.org.uk/resources/whats-best-insulation-material/](http://www.superhomes.org.uk/resources/whats-best-insulation-material/) * [www.building.co.uk/data/sustainability-thermal-insulation/3075146.article](http://www.building.co.uk/data/sustainability-thermal-insulation/3075146.article) | **Worksheet 3**  Feedback on Worksheet 3 |
| 4  3 hours | 1. **Understand the design of buildings and structures**   1.4 Designing waste out of projects | Activities:   * Deliver PowerPoint 1 and discuss how planning in the design stage can help reduce the materials required to construct a building. Explain how phased delivery reduces waste and damage and discuss recycling/repurposing materials. * Explain how FIFO helps save materials by ensuring perishable materials are used in sequence.   Resources:   * **PowerPoint 1: Know the design of buildings and structures** * **Worksheet 4: Designing waste out of projects** | **Worksheet 4**  Feedback on Worksheet 4 |
| 5  3 hours | 1. **Understand the design of buildings and structures**   1.5 Plans and documentation used in construction | Activities:   * Deliver PowerPoint 1 and explain the purposes of common types of drawings used in construction including the scales used on each type. Block, site, floor, detailed, range. * Explain the different projections used in construction drawings including orthographic, isometric and wiring. * Discuss the main documentation used alongside drawings: schedules and specifications. * Explain the differences between hatchings, symbols and abbreviations used in construction drawings.   Resources:   * **PowerPoint 1: Know the design of buildings and structures** * **Worksheet 5: Plans and documents used in construction** | **Worksheet 5**  Feedback on Worksheet 5 |
| 6  3 hours | 1. **Know the planning process**   2.1 Roles and responsibilities | Activities:   * Facilitate classroom discussion. * Deliver PowerPoint 2 and discuss the description of differences between the roles of the development control officer, built heritage conservation officer and building control officer (local authority or Approved Inspector). * Discuss how building control monitors the construction of a building inspecting work at various stages ensuring that the minimum quality standards are adhered to.   Resources:   * **PowerPoint 2: Know the planning process** * **Worksheet 6: Roles and responsibilities** | **Worksheet 6**  Feedback on Worksheet 6 |
| 7  3 hours | 1. **Know the planning process**   2.2 Primary planning legislation and regulations | Activities:   * Facilitate classroom discussion. * Deliver PowerPoint 2 and introduce learners to the main types of consent or approval. * Discuss the different types of planning permissions available – when they are available, how they are used and the implications of breaching them. * Ask learners to give examples of builds that are permitted using permitted development rights. * Show learners how to access and check updates to the Building Regulations: <https://www.planningportal.co.uk/info/200135/approved_documents>   **Resources:**   * **PowerPoint 2:** **Know the planning process** * **Worksheet 7: Primary planning legislation and regulations** * [Scheduled Monuments | Cadw (gov.wales)](https://cadw.gov.wales/advice-support/historic-assets/scheduled-monuments) * [Consent types – Planning Portal – Wales](https://www.planningportal.co.uk/wales_en/info/5/applications/58/consent_types) | **Worksheet 7**  Feedback on Worksheet 7 |
| 8  3 hours | 1. **Know the planning process**   2.3 Heritage protection | Activities:   * Ask learners if they can explain what constitutes a heritage building. * Deliver PowerPoint 2 and introduce learners to the different types of heritage protection: listed building (Grade I, II\* and II), scheduled monument, conservation area, World Heritage Site, local listing, Ecclesiastical Exemption. * Describe the different grades of listed buildings. * Learners to research and discuss local listed buildings and their importance to local history and heritage etc. * Discuss the limitations effecting the work allowed and restrictions imposed within a conservation area and the penalties for breaching the legislation.   Resources:   * **PowerPoint 2:** **Know the planning process** * **Worksheet 8: Heritage listings** * Legislation covering listed buildings and conservation areas include the Planning (Listed Buildings and Conservation Areas) Act 1990:   <https://www.legislation.gov.uk/ukpga/1990/9/contents>   * Ecclesiastical Exemptions: <http://www.legislation.gov.uk/wsi/2018/1087/contents/made> | **Worksheet 8**  Feedback on Worksheet 8 |
| 9  3 hours | 1. **Understand the stages of construction and the installation of services**   3.1Building structure | Activities:   * Deliver PowerPoint 3 and explore how a building is constructed with three distinct parts: the substructure, superstructure and internal components, describing how they all interact to form a complete structure.   Discuss:   * types of foundations and when it is appropriate to use each form. * common brick bonds, and materials used to construct external walls. * a range of construction methods for ground and upper floors. * a range of roof construction methods including traditional hand-cut and modern trusses. * a range of traditional and modern roof covering materials. * the range of stair types including straight, and stairs with turns. * what constitutes internal components and show examples.   Resources:   * **PowerPoint 3: Understanding the stages of construction and the installation of services** * **Worksheet 9: Building structure** | **Worksheet 9**  Feedback on Worksheet 9 |
| 10  3 hours | 1. **Understand the stages of construction and the installation of services**   3.2 Typical sequence of tasks used to construct a two-storey building | Activities:   * Discuss the sequence of construction of a two-storey building and what labour and plant is required at each stage of the construction process. * Discuss the various methods that a work programme can be produced by Gantt charts, critical path analysis, etc. * Explain the importance of careful planning and the implications of poor planning on the work programme – use the 6Ps to demonstrate this. * Learners to produce a basic programme of work.   Resources:   * **PowerPoint 3: Understanding the stages of construction and the installation of services** * **Worksheet 10: Sequence of works 1** * **Worksheet 11: Sequence of works 2** | **Worksheets 10 and 11**  Feedback on Worksheets  10 and 11 |
| 11  3 hours | 1. **Understand the stages of construction and the installation of services**   3.3 Effective and productive working relationships between trades | Activities:   * Explain the advantages and disadvantages of a range of communication methods used within the sector. * Explain why various forms of communication are used in different settings, i.e. safety signs and notices displayed in prominent places reinforcing PPE requirements etc. * Discuss the importance of clear and concise communications and the implications of miscommunication.   Resources:   * **PowerPoint 3: Understanding the stages of construction and the installation of services** * **Worksheet 12: Communications** | **Worksheet 12**  Feedback on Worksheet 12 |
| 12  3 hours | 1. **Know the methods of promoting the services offered within the construction and built environment sector**   4.1 Methods of marketing  4.2 The impact of successful marketing on businesses | Activities:   * Ask learners to give examples of different marketing methods. * Discuss how marketing has evolved over time and how social media has become a major marketing tool. * Explain what defines a small to medium-sized enterprise (SME) and a large company. * Discuss the impact that successful marketing can have on a business and how investment is required for both marketing and to fund any growth in the business from successful marketing activities.   Resources:   * **PowerPoint 4:** **Know the methods of promoting the services offered within the construction and built environment sector** * **Worksheet 13: Marketing and business development** | **Worksheet 13**  Feedback on Worksheet 13 |
| 13  3 hours | 1. **Know types of and purposes of maintenance of buildings, structures and installed services**   5.1 Types of servicing, maintenance schedules and repairs for construction and BSE trades | Activities:   * Discuss planned and unplanned maintenance programmes and the advantages and disadvantages of each. * Explain what a service plan is and give examples of when they are used. * Discuss the tasks that different construction and building services tradespeople complete.   Resources:   * **PowerPoint 5: Knowing the purpose of maintaining buildings, structures and installed services** * **Worksheet 14: Maintaining buildings and services** | **Worksheet 14**  Feedback on Worksheet 14 |
| 14  3 hours | 1. **Know types of and purposes of maintenance of buildings, structures and installed services**   5.2 The purpose of servicing and maintenance | Activities:   * Discuss how the regular maintenance of the fabric of a building extends the life and reduces long-term costs. * Discuss the benefits of regularly servicing electrical, gas and IT systems for effective running and the longevity of the appliances. * Discuss the health and safety consequences from poorly maintained gas and electrical appliances.   **Resources:**   * **PowerPoint 5: Knowing the purpose of maintaining buildings, structures and installed services** * **Worksheet 15: Maintenance** | **Worksheet 15**  Feedback on Worksheet 15 |
| 15  3 hours | 1. **Understand repurposing of buildings and structures**   6.1 Repurposing and reinstatement of buildings and structures | Activities:   * Deliver PowerPoint 6. * Share local/regional examples of repurposing or reinstatement of buildings, e.g. conversion of the King’s Head hotel into offices in Newport. * Explain how buildings that are no longer fit for the original purpose they were built for can be repurposed to meet the needs of local business and housing needs. * Explain how modernising homes can regenerate inner towns and cities while maintaining cultural and historic aspects. * Discuss how system upgrades are important in ensuring homes and businesses keep up-to-date with developments in technology and fuel-efficient heating systems.   Resources:   * **PowerPoint 6: Understanding repurposing of buildings and structures** * **Worksheet 16: Repurposing and reinstatement of buildings** * <https://www.southwalesargus.co.uk/resources/images/8557343.jpg?display=1&htype=0&type=responsive-gallery> – King’s Head hotel, Newport: formerly derelict then converted in 2018 into offices. | **Worksheet 16**  Feedback on Worksheet 16 |
| 16  3 hours | 1. **Understand repurposing of buildings and structures**   6.2 Recycling and reuse | Activities:   * Deliver PowerPoint 6. * Explain what is meant by the terms ‘recycle’ and ‘reuse’ within the construction and building services sector. * Discuss the benefits of recycling (protection of natural resources, amount of energy saved reducing the carbon footprint of material/component production). * Explain how masonry products can be recycled on-site to produce aggregates, resulting in the protection of natural resources and a reduction in the amount of carbon released in the processing and transportation of materials. * Discuss how architectural salvage gives items a new lease of life and explain its importance in maintaining historic buildings.   **Resources:**   * **PowerPoint 6: Understanding repurposing of buildings and structures** * **Worksheet 17: Recycle and reuse** | **Worksheet 17**  Feedback on Worksheet 17 |
| 17  4 hours | 1. **Know the process for demolition and destruction of buildings and structures**   7.1 Requirements in decommissioning  7.2 Methods of demolition | Activities:   * Explain the various methods of demolition and when they are used. * Discuss the specific risks associated with demolition and the procedures that are in place to mitigate this. Look at the HSE statistics on injuries in the construction industry. * Discuss the importance of risk assessments and method statements directly relating to the high-risk task of demolition. * Look at example of workers dismantling the dangerous sections of the Mackintosh Building at the Glasgow School of Art brick by brick.   **Resources:**   * **PowerPoint 7: Know the process for demolition and destruction of buildings and structures** * **Worksheet 18: Risks associated with demolition** * **Worksheet 19: Health and safety during demolition** * **Worksheet 20: Demolition methods** * Link to video showing wrecking ball in action: <https://www.dailymotion.com/video/x61zll3> * Video link showing implosion of three tower blocks:   <https://youtu.be/uMIiQGkLQo8>   * Mackintosh Building: <https://www.theconstructionindex.co.uk/assets/news_articles/2018/07/1531293872_mackintosh.jpg> * <https://www.hse.gov.uk/statistics/pdf/fatalinjuries.pdf> | **Worksheets 18–20**  Feedback on Worksheets 18–20 |
| 18  3 hours | 1. **Know the process for demolition and destruction of buildings and structures**   7.3 Demolition waste removal | Activities:   * Explain the impact demolition waste can have on the local environment if not contained within the site boundaries. * Discuss a safe sequence of operations that best allows for the recycling and reuse of building components.   Resources:   * **PowerPoint 7: Know the process for demolition and destruction of buildings and structures** * **Worksheet 21: Sequence of waste removal** * For further information visit the HSE website <https://www.hse.gov.uk/construction/safetytopics/demolition.htm> | **Worksheet 21**  Feedback on Worksheet 21 |