Unit 106: Introduction to emerging technologies in construction and the built environment sector

# Sample scheme of work

This sample scheme of work covers both classroom- and workshop-based learning for Unit 106. It is based on 2 hours per session for 10 sessions. It is an example only of a possible scheme of work and is based on theory and practical learning within an FE centre, but can be amended to suit all learning facilities with the necessary adjustments to meet the needs of individual learners.

**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 106: Introduction to emerging technologies in construction and the built environment Sector

# Sample scheme of work

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

**Number of sessions**:10 **Delivery hours**: 20 **Venue**: **Group**:

|  |
| --- |
| **Learning outcomes**   1. Know the use of Building Information Modelling (BIM) within construction and the built environment 2. Know about emerging technologies and materials 3. Know about off-site construction |

| Session | Objectives/learning outcomes **The learner will:** | Activities and resources | Skills check |
| --- | --- | --- | --- |
| 1  Theory  2 hours | **Introduction to unit**   1. Know the use of Building Information Modelling (BIM) within construction and the built environment 2. Know about emerging technologies and materials 3. Know about off-site construction   . | Activities:   * Classroom discussion: What do we mean by emerging technologies? * Show PowerPoint 1: Introduction to the unit. * Set Worksheet 1 and discuss the answers as a group. * Set internet search activity (Worksheet 2). Share your findings and discuss as a group. * As a class watch and discuss the videos to introduce BIM and off-site construction.   Resources:   * **PowerPoint 1: Introduction to the unit** * **Worksheet 1: Introduction to the unit** * **Worksheet 2: Internet search**   Video introducing BIM from the B1M website:  <https://youtu.be/s1yN-LMs_jU>  Video/animation introducing digital design tools that can be used in off-site construction  <https://www.offsiteready.com/training-materials/digital-design> | **Worksheets 1 and 2**  **Classroom discussion** |
| 2  Theory  2 hours | 1. **Know the use of Building Information Modelling (BIM) within construction and the built environment**   1.1 Introduction to BIM | Activities:   * Classroom discussion: How has BIM changed the construction industry? * Show PowerPoint 2: BIM 1. * Learners to complete activity: Search online to find an example of a construction project in Wales that utilised BIM. What benefits did using BIM bring to the project? * Set Worksheet 3.   Resources:   * **PowerPoint 2: BIM 1** * **Worksheet 3: Introduction to BIM** | **Worksheet 3** |
| 3  2 hours | 1. **Know the use of Building Information Modelling (BIM) within construction and the built environment**   1.2 Key terminology | Activities:   * Classroom discussion: How has BIM changed the construction industry? * Show PowerPoint 3: BIM 2. * As a class, watch and discuss the video on Common Data Environment. * From the information shown and their own research, learners to draw a step-by-step diagram of the BIM lifecycle, including their own definitions of the key stages.   Resources:   * **PowerPoint 3: BIM 2** * **Worksheet 4: Key terminology** * Video of the Common Data Environment on the B1M channel:   <https://youtu.be/EJbn16ww8Yw> | **Worksheet 4** |
| 4  2 hours | 1. **Know the use of Building Information Modelling (BIM) within construction and the built environment**   1.2 Key terminology | Activities:   * Classroom discussion: What do you think the BIM protocol is for? * Show PowerPoint 4: BIM 3. * Activity: Create a timeline showing the key developments in emerging technologies in construction over the last ten years.   Resources:   * **PowerPoint 4: BIM 3** * **Worksheet 5: Internet search** | **Worksheet 5** |
| 5  2 hours | 1. **Know about emerging technologies and materials**   2.1 Introduction to 3D Printing | Activities:   * Classroom discussion: How many new technologies in construction have you already heard of? * Show PowerPoint 5: Emerging technologies and materials1. * Show and discuss video 1. * Show and discuss video 2.   Resources:   * **PowerPoint 5: Emerging technologies and materials 1** * **Worksheet 6: 3D printing** Metal Bridge 3D Printing:   <https://youtu.be/1r_Azsa4nqU>   * Tech Machine channel on YouTube: the 5 best 3D printers for printing houses 2020, 10-minute video:   <https://youtu.be/MK5vvZfbWNo> | **Worksheet 6** |
| 6  2 hours | 1. **Know about emerging technologies and materials**   2.2 Introduction to immersive technologies | Activities:   * Classroom discussion. * Show PowerPoint 6: Emerging technologies and materials2. * Show and discuss videos as a class. * Activity: Set learners a search task: carry out an internet search on the following terms: * (VR) Virtual Reality * (MR) Mixed Reality * (AR) Augmented Reality * Learners should write their own definition of each and share with the class.   Resources:   * **PowerPoint 6: Emerging technologies and materials 2** * **Worksheet 7: Immersive technology** * Mixed Reality with Trimble Connect & Microsoft Hololens video:   <https://youtu.be/tApp7r5-_-M>   * 3-minute video in a little more detail:   <https://youtu.be/_6xBkXcxVHI> | **Worksheet 7** |
| 7   1. hours | 1. **Know about emerging technologies and materials**   2.3 Evolving materials | Activities:   * Classroom discussion: what does the term ‘evolving materials’ mean? * Show PowerPoint 7: Emerging technologies and materials3. * Show video 1 and discuss. * Show video 2 and discuss. * In groups or pairs, ask learners to research one of the evolving materials listed and present a summary of its uses and benefits to the class: * Graphene * Surface coverings * Ventilated building materials * Liquid roof * Transparent aluminium * Self-healing concrete   Resources:   * **PowerPoint 7: Emerging technologies and materials 3** * **Worksheet 8: Evolving materials** * Breathable (ventilated) façade 2-minute video:   [https://youtu.be/a67brMDgiW4](https://youtu.be/a67brMDgiW4F)   * Futurism Creative 22 June 2016 website:   <http://futurism.com>   * Transparent aluminum (24-minute video):   <https://www.youtube.com/watch?v=DduO1fNzV4w> | **Worksheet 8** |
| 8  2 hours | 1. **Know about off-site construction**   3.1 Benefits of pre-fabricated construction  3.2 Types of pre-fabrication work | Activities:   * Classroom discussion: discuss the benefits of pre-fabricated construction. * Show video 1 and discuss. * Show PowerPoint 8: Off-site construction 1.   Resources:   * **PowerPoint 8: Off-site construction 1** * **Worksheet 9: Off-site construction**   Off-site manufacture 2-minute animation video:  [https://youtu.be/Hgq14W6v2vU](https://protect-eu.mimecast.com/s/cUqRCZ4AviP5wgAHzruC1?domain=youtu.be) | **Worksheet 9** |
| 9  2 hours | 3. **Know about off-site construction**  3.2 Types of pre-fabrication works | Activities:   * Classroom discussion: discuss different types of pre-fabricated works. * Show video 1 and discuss. * Show PowerPoint 9: Off-site construction 2.   Resources:   * **PowerPoint 9: Off-site construction 2** * **Worksheet 10: Types of off-site construction** * Onsite placement and assembly animation:   [https://youtu.be/viVnHu7h5bM](https://protect-eu.mimecast.com/s/WyO-C1j0EinM0GxTGTtEw?domain=youtu.be) | **Worksheet 10** |
| 10  2 hours | **3**.  **Know about off-site construction** | Activities:   * Classroom discussion: discuss examples of off-site construction from local industry. * Show PowerPoint 10: Off-site construction 3. * Learners to complete multiple choice questions to check their understanding.   Resources:   * **PowerPoint 10: Off-site construction 3** * **Multiple choice questions** | **Multiple choice questions** |