Year 11 Big Picture – Construction 2022-23

Year 11 Overview

The year 11 students will be completing two units of work this academic year. One internally assed piece of practical and theory work for the external examination. The three units of work are as follows.

Unit 1 Construction Technology

This is a mandatory unit which the students must complete which will be externally assessed.

This unit will initially examine the different forms of construction that can be used for low-rise (up to 5.2 metres in height) offices, retail units and homes. The use of prefabrication to construct buildings is now a sustainable method used to build quickly and reduce damage to the environment. You will examine the modern methods of construction that rely heavily on offsite prefabrication, which benefits the environment sustainably.

Learning aims

- A understand the structural performance required for low-rise construction
- B explore how sub-structures are constructed
- C explore how superstructures are constructed.

Unit 2 Scientific and Mathematical Applications for Construction

This is a mandatory unit which the students must complete which will be internally assessed.

This unit aims to develop the students understanding of the science and mathematics used in construction projects. It will help them to develop the mathematical and scientific skills needed to solve a variety of construction problems.

The content of the unit has been designed to focus specifically on concepts that will be clearly and immediately useful to the students when undertaking construction-related activities. They will be able to appreciate the importance of these concepts to the construction industry and be much better placed to apply them in a wide vocational context.

Learning Aims

- **A** understand the effects of forces and temperature changes on materials used in construction
- **B** use mathematical techniques to solve construction problems.

Unit 3 Construction and Design

On completing this unit, the students will understand what the construction industry undertakes in terms of the different types of buildings and structures it designs and builds. They will learn how client briefs can be developed by analysing the client's requirements for the building and considering the external constraints on development. The students will also gain an understanding of the different types of construction activities that take place within the industry, from new build through to the refurbishment of existing older buildings. The contribution that construction makes to the UK built environment and the economy cannot be overestimated in terms of health and safety, design, wealth and comfort.

Learning Aims

- **A** understand the work of the construction industry
- **B** understand a client's needs to develop a design brief for a low-rise building

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- **C** produce a range of initial sketch ideas to meet the requirements of a client brief for a low-rise building.

Autumn 01 2022 Weeks 1 – 7 (7 weeks) OCTOBER HALF TERM	***Autumn 02 2022 Weeks 8 – 15 (7 weeks) CHRISTMAS***	***Spring 01 2023 Week 16- 22 (7 weeks) FEBRUARY HALF TERM***
Content **Unit 1** Construction Technology **Learning aims** • A understand the structural performance required for low-rise construction • B explore how sub-structures are constructed • C explore how superstructures are constructed **Unit 2** Scientific and Mathematical Applications for Construction **Learning Aims** **A** understand the effects of forces and temperature changes on materials used in construction **B** use mathematical techniques to solve construction problems. **Unit 3** **Topic B.1 Understanding a client's needs** Understanding the client's needs in terms of – ● Sustainability: materials thermal efficiency alternative energies orientation carbon footprint. ● Building use: residential communal space retail	**Content** **Unit 1** Construction Technology **Learning aims** • A understand the structural performance required for low-rise construction • B explore how sub-structures are constructed • C explore how superstructures are constructed **Unit 3** Construction and Design **Learning Aims** **Topic A.1 The construction industry and the built environment** Understand how the construction industry contributes to and impacts on wider society including: ● The design of attractive, aesthetically pleasing structures and buildings that make our built environment pleasant to live in: designing for appearance and aesthetics designing for sustainability designing for functionality designing for occupant and public safety. ● The contribution to the infrastructure of the built environment in terms of: roads drainage provision of services (gas, electricity, water and communication technology)	**Content** **Unit 1** Construction Technology **Learning aims** • A understand the structural performance required for low-rise construction • B explore how sub-structures are constructed • C explore how superstructures are constructed **Unit 2** Scientific and Mathematical Applications for Construction **Learning Aims** A understand the effects of forces and temperature changes on materials used in construction B use mathematical techniques to solve construction problems. **Unit 3** Construction and Design **Learning Aims** **Topic A.1 The construction industry and the built environment** Understand how the construction industry contributes to and impacts on wider society including: ● The design of attractive, aesthetically pleasing structures and buildings that make our built environment pleasant to live in: designing for appearance and aesthetics designing for sustainability

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industrial. ● Accommodation: rooms size function space orientation floors. ● Style and aesthetics: external street scene internal style preferred materials mood boards colours. **Topic B.3 Production of a client brief for a low-rise building** Using the analysis of needs and constraints, produce a client brief that will aid the development of appropriate design solutions: ● existing situation ● project requirements ● budget ● design factors and constraints ● specification for internal and external features ● mood board ● end users. **Skills**:	flood defences. ● The inclusion of the community in terms of: housing green spaces transport hubs employment opportunities security. ● The economic benefits and employment opportunities that construction brings, develops and maintains in terms of: jobs and careers wealth generated by property and land development regeneration of inner-city areas. ● Consideration of the benefits that the construction sector brings to: the built environment the local community the UK as a whole. **Skills:**	designing for functionality designing for occupant and public safety. ● The contribution to the infrastructure of the built environment in terms of: roads drainage provision of services (gas, electricity, water and communication technology) flood defences. ● The inclusion of the community in terms of: housing green spaces transport hubs employment opportunities security. ● The economic benefits and employment opportunities that construction brings, develops and maintains in terms of: jobs and careers wealth generated by property and land development regeneration of inner-city areas. ● Consideration of the benefits that the construction sector brings to: the built environment the local community the UK as a whole. **UNIT 3 C** **Topic C.1 Generation of initial sketch ideas to facilitate development of the final design solution** ● Initial sketch ideas in response to the client brief: freehand sketching floor plans to approximate scale

		freehand sketching external views in one- or two-point perspective concept ideas for external appearance concept ideas for internal layout. ● Client approval and review of ideas against the client brief: review of the ideas against the client brief client feedback and concept selection. ● Responding to client feedback: amend and refine ideas to produce sketches for the final concept or a 3D CAD model for the final concept addition of annotations to communicate construction form and type. ● Initial calculation to design solution: areas volumes loading waste material budget and cost sustainability calculations. **Skills:**
Assessment Objectives This is the knowledge, application and skills assessed by the Progress check Unit 1 Mini test 1 Class feedback sheets to be completed based on the skills covered during the unit of work. This is to	**Assessment Objectives** This is the knowledge, application and skills assessed by PPE/BT1 Unit 1 Mini Test 2 Class feedback sheets to be completed based on the skills covered during the unit of work. This is to	**Assessment Objectives** This is the knowledge, application and skills assessed by the Mini test 3 Class feedback sheets to be completed based on the skills covered during the unit of work. This is to

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raise and rectify all the misconceptions, so students perform better **Attitude to Learning (ATL) - Data capture**	raise and rectify all the misconceptions, so students perform better **Attitude to Learning (ATL) - Data capture**	raise and rectify all the misconceptions, so students perform better **Attitude to Learning (ATL) & Big test % - Data capture**
Spring 02 ***Weeks 23 – 27 (5 weeks)*** ***EASTER***	***Summer 01*** ***Weeks 28 – 33 (6 weeks)*** ***WHIT***	***Summer 02*** ***Weeks 34 – 40 (7 weeks)***
Content **UNIT 1** Construction Design The students will continue to look at the theory towards this unit and reflect on work already covered. • A understand the structural performance required for low-rise construction • B explore how sub-structures are constructed • C explore how superstructures are constructed **UNIT 3 A** **Topic A.2 The type of activities undertaken in the construction industry** Know the range of work that the construction industry undertakes including: ● Civil engineering, infrastructure works including railways, motorways, roads, bridges, airports, service distribution, sewers, tunnels, sea defences, flood defences, river and harbour works, renewable energies ● Industrial: factories, workshops, industrial estates, warehousing ● Residential: private housing, apartments, sheltered housing, social housing ● Commercial: banks, offices, business parks **What needs to be learnt** ● Retail: shops, retail shopping parks, shopping centres	**Content** **UNIT 1** Construction Design The students will continue to look at the theory towards this unit and reflect on work already covered. • A understand the structural performance required for low-rise construction • B explore how sub-structures are constructed • C explore how superstructures are constructed **UNIT 3 B** **Topic B.2 Understanding the constraints on design** The client and design team will need to consider other influences and constraints on design to include – ● Resources: budget – initial costs and life cycle costs – market positioning – level of specification – specialist skills required site – area – location – access – services building	**Content** **Topic B.3** Production of a client brief for a low-rise building Using the analysis of needs and constraints, produce a client brief that will aid the development of appropriate design solutions: ● existing situation ● project requirements ● budget ● design factors and constraints ● specification for internal and external features ● mood board ● end users. **Skills:**

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● Health: hospitals, clinics, health centres, doctors' surgeries ● Education: schools, colleges, universities, training centres ● Leisure and recreation: leisure centres, cinemas, swimming pools, stadiums, sports facilities ● Activities: design and construction of buildings and structures, design and construction of infrastructure works, refurbishment of existing buildings, repairs and maintenance of building, estates management, facilities management. **UNIT 3 C** **Topic C.1 Generation of initial sketch ideas to facilitate development of the final design solution** ● Initial sketch ideas in response to the client brief: freehand sketching floor plans to approximate scale freehand sketching external views in one- or two-point perspective concept ideas for external appearance concept ideas for internal layout. ● Client approval and review of ideas against the client brief: review of the ideas against the client brief client feedback and concept selection. ● Responding to client feedback: amend and refine ideas to produce sketches for the final concept or a 3D CAD model for the final concept addition of annotations to communicate construction form and type.	– size – structural form – materials – sustainability. Local planning and building control requirements: local plan building regulations local needs style height materials structural form density community consultations planning objections. ● Timescales: completion date contract period. **Skills:**	

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● Initial calculation to design solution: areas volumes loading waste material budget and cost sustainability calculations. **Skills**:		
Assessment Objectives This is the knowledge, application and skills assessed by the PPE BT 2 Mini test 4 Class feedback sheets to be completed based on the skills covered during the unit of work. This is to raise and rectify all the misconceptions, so students perform better **Attitude to Learning (ATL) - Data capture**	**Assessment Objectives** This is the knowledge, application and skills assessed by Mini Test 5: Class feedback sheets to be completed based on the skills covered during the unit of work. This is to raise and rectify all the misconceptions, so students perform better **Attitude to Learning (ATL) - Data capture**	**Assessment Objectives** This is the knowledge, application and skills assessed by Mini Test 6: Class feedback sheets to be completed based on the skills covered during the unit of work. This is to raise and rectify all the misconceptions, so students perform better **Attitude to Learning (ATL) - Data capture**