

Pearson BTEC Level 4 Higher National Certificate in Construction and The Built Environment
(Civil Engineering)

Pearson BTEC Level 5 Higher National Diploma in Construction and The Built Environment
(Civil Engineering)

BCE01-4 Individual Project

1. Formulate a project that will provide a solution to an identified problem
2. Manage a project within agreed timescales and specification; documenting the process throughout
3. Evaluate potential project management solutions
4. Produce a project report and deliver a presentation of the final project outcomes.

BCE02-4 Construction Technology

1. Explain the terminology used in construction technology
2. Describe the different techniques used to construct a range of substructures and superstructures, including their function and design selection criteria
3. Identify the different types of civil engineering/infrastructure technology used in support of buildings
4. Illustrate the supply and distribution of a range of building services and how they are accommodated within the building.

BCE03-4 Science & Materials

1. Review health & safety regulations and legislation associated with the storage, handling and use of materials on a construction site
2. Discuss the environmental and sustainability factors which can impact on and influence the material choices for a construction project
3. Present material choices for a given building using performance properties, experimental data, sustainability and environmental consideration
4. Evaluate the performance of a given building in respect of its human comfort requirements.

BCE04-4 Construction Practice & Management

1. Describe the construction industry with reference to company structures and other activities
2. Explain different types of construction companies in the market and their relationships within the tendering process
3. Discuss the key stages in a construction project, and how Building Information Modelling informs the different stages
4. Analyse how the construction industry has developed suitable collaboration strategies in support of greater recognition of Health & Safety.

BCE06-4 Construction Information (Drawing, Detailing, Specification)

1. Evaluate different types of construction information in the context of diverse project types
2. Develop construction drawings, details, schedules and specifications in support of a given construction project
3. Interpret different types of construction information in order to explain a construction project
4. Assess ways in which construction professionals collaborate in the production of construction information.

BCE08-4 Mathematics for Construction

1. Use analytical and computational methods to solve construction related problems
2. Investigate applications of statistical techniques to interpret, organise and present data by using appropriate computer software packages
3. Illustrate the wide-ranging uses of calculus within different construction disciplines by solving problems of differential and integral calculus.
4. Use mathematical methods to solve vector analysis, arithmetic progression and dimensional analysis examples.

BCE18-4 Civil Engineering Technology

1. Explain the methods and techniques used in civil engineering for earthworks and substructures
2. Present a site safety plan, risk assessment and method statement for a given civil engineering activity
3. Evaluate a given civil engineering problem and propose a solution
4. Prepare a design proposal for a new infrastructure project.

BCE20-4 Principles of Structural Design

1. Calculate bending moments and shear forces for simply supported steel and concrete beams
2. Determine deflection for simply supported steel beams
3. Calculate the axial load carrying capacity of steel and reinforced concrete columns
4. Explore design methods for steel, reinforced concrete beams and columns.

BCE22-5 Group Project

1. Assess individual and group skills in order to allocate roles within a collaborative team
2. Plan a construction project, based on the Pearson-set theme, in collaboration with others to ensure good practice in resource management, staffing and project scheduling
3. Prepare tender documentation; undertaking work appropriate to a defined role within a team
4. Evaluate own work, and the work of others, in a collaborative team.

BCE28-5 Further Mathematics for Construction

1. Apply instances of number theory in practical construction situations
2. Solve systems of linear equations relevant to construction applications using matrix methods
3. Approximate solutions of contextualised examples with graphical and numerical methods
4. Review models of construction systems using ordinary differential equations.

BCE29-5 Geotechnics & Soil Mechanics

1. Review rock types, their formation and uses within civil engineering
2. Explore and classify soils to current codes of practice
3. Analyse soil properties determined by geotechnical procedures
4. Produce a proposal to address identified geotechnical weaknesses and problems.

BCE30-5 Advanced Structural Design

1. Explore deflection due to wind loadings, on fixed structures, and strategies to resist wind loading

2. Determine bending, shear and deflection for complex support conditions
3. Design complex columns and piled foundations based on calculation
4. Explore the design of tensile structures.

BCE37-5 Environmental Assessment & Monitoring

1. Discuss what is meant by sustainability and its relevance to the built environment
2. Compare the ways that sustainability in construction can be quantified, assessed and monitored, and how this can be used to drive change in the construction industry
3. Evaluate the features and drivers behind different environmental assessment methods
4. Carry out an environmental assessment on a building; comparing its performance with similar buildings.

BCE42-5 Highway Engineering

1. Evaluate how a new highway route is identified, planned and designed
2. Assess the methods of earthwork operations, bridges and tunnelling which are used in connection with the provision of highways
3. Justify the selection of pavement construction type for a given highway provision
4. Present a report that specifies improvement that can be made to a given highway infrastructure project, including maintenance techniques and planning.

BCE43-5 Hydraulics

1. Apply concepts of physics to develop solutions for hydrostatic and hydrodynamic problems
2. Calculate forces related to fluids at rest and in motion
3. Develop practical solutions for the distribution of fluids within correctly sized pipes
4. Calculate the hydrostatic pressure exerted on substructures for a given context.