

# ICTQual AB

## Qualification Specification



### Level 3 Diploma in Civil Engineering 60 Credits – 6 Months



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# ICTQual AB

## Level 3 Diploma in Civil Engineering

### 60 Credits – 6 Months

#### Contents

About ICTQual AB .....	2
Course Overview .....	2
Certification Framework .....	3
Entry Requirements .....	3
Qualification Structure.....	4
Centre Requirements .....	4
Support for Candidates.....	5
Assessment.....	6
Unit Descriptors.....	7

# Qualification Specifications about

## ICTQual Level 3 Diploma in Civil Engineering 60 Credits – 6 Months

### About ICTQual AB

ICTQual AB UK Ltd. is a distinguished awarding body based in the United Kingdom, dedicated to fostering excellence in education, training, and skills development. Committed to global standards, ICTQual AB provides internationally recognized qualifications that empower individuals and organizations to thrive in an increasingly competitive world. Their offerings span diverse industries, including technical fields, health and safety, management, and more, ensuring relevance and adaptability to modern workforce needs.

The organization prides itself on delivering high-quality educational solutions through a network of Approved Training Centres worldwide. Their robust curriculum and innovative teaching methodologies are designed to equip learners with practical knowledge and skills for personal and professional growth. With a mission to inspire lifelong learning and drive positive change, ICTQual AB continuously evolves its programs to stay ahead of industry trends and technological advancements.

ICTQual AB's vision is to set benchmarks for educational excellence while promoting inclusivity and integrity. Their unwavering focus on quality and accessibility makes them a trusted partner in shaping future-ready professionals and advancing societal progress globally.

### Course Overview

The ICTQual Level 3 Diploma in Civil Engineering is a comprehensive 60-credit program designed to be completed in 6 months. This diploma equips learners with foundational knowledge and practical skills essential for entering the dynamic field of civil engineering. It covers key areas such as structural analysis, construction materials, project planning, and sustainability practices. By emphasizing both theoretical understanding and hands-on application, the program prepares students for immediate entry-level roles in civil engineering or further studies in related disciplines.

Graduates of this qualification are well-prepared to contribute to the design, development, and maintenance of critical infrastructure projects. They also gain insight into emerging technologies and sustainable practices, ensuring readiness for modern industry challenges. The program offers a balance of academic rigor and practical experience, making it an ideal stepping stone for aspiring civil engineers.

## Certification Framework

<b>Qualification title</b>	<b>ICTQual Level 3 Diploma in Civil Engineering 60 Credits – 6 Months</b>
<b>Course ID</b>	CE0004
<b>Qualification Credits</b>	60 Credits
<b>Course Duration</b>	6 Months
<b>Grading Type</b>	Pass / Fail
<b>Competency Evaluation</b>	Coursework / Assignments / Verifiable Experience
<b>Assessment</b>	The assessment and verification process for ICTQual qualifications involves two key stages:  <b>Internal Assessment and Verification:</b> <ul style="list-style-type: none"><li>✓ Conducted by the staff at the Approved Training Centre (ATC). Ensures learners meet the required standards through continuous assessments.</li><li>✓ Internal quality assurance (IQA) is carried out by the centre's IQA staff to validate the assessment processes.</li></ul> <b>External Quality Assurance:</b> <ul style="list-style-type: none"><li>✓ Managed by ICTQual AB verifiers, who periodically review the centre's assessment and IQA processes.</li><li>✓ Verifies that assessments are conducted to the required standards and ensures consistency across centres</li></ul>

## Entry Requirements

To enrol in the ICTQual Level 3 Diploma in Civil Engineering 60 Credits – 6 Months, candidates must meet the following entry requirements:

- ✓ A minimum of a Level 2 qualification (e.g., GCSEs, NVQ Level 2, or equivalent). A strong foundation in mathematics and science is highly recommended, as these subjects are integral to civil engineering concepts.
- ✓ Applicants must typically be 16 years or older.
- ✓ Proficiency in English is essential, as the course involves technical terminology, report writing, and communication.
- ✓ Basic computer literacy is advantageous, as some modules may involve software tools like CAD (Computer-Aided Design).
- ✓ While not mandatory, any prior experience in construction, surveying, or a related field can be beneficial.

## Qualification Structure

This qualification comprises 6 mandatory units, totalling 60 credits. Candidates must successfully complete all mandatory units to achieve the qualification.

Mandatory Units		
Unit Ref#	Unit Title	Credits
CE0004-1	Construction Technology and Materials	10
CE0004-2	Structural Mechanics and Design	10
CE0004-3	Site Surveying and Geotechnics	10
CE0004-4	Health, Safety, and Environmental Practices	10
CE0004-5	Project Management Fundamentals	10
CE0004-6	Civil Engineering Drawing and CAD	10

## Centre Requirements

Even if a centre is already registered with ICTQual AB, it must meet specific requirements to deliver the ICTQual Level 3 Diploma in Civil Engineering 60 Credits – 6 Months. These standards ensure the quality and consistency of training, assessment, and learner support.

### 1. Approval to Deliver the Qualification

- ✓ Centres must obtain formal approval from ICTQual AB to deliver this specific qualification, even if they are already registered.
- ✓ The approval process includes a review of resources, staff qualifications, and policies relevant to the program.

### 2. Qualified Staff

- ✓ **Tutors:** Must have relevant qualifications in civil engineering or construction at Level 4 or higher, alongside teaching/training experience.
- ✓ **Assessors:** Must hold a recognized assessor qualification and demonstrate expertise in civil engineering
- ✓ **Internal Quality Assurers (IQAs):** Must be appropriately qualified and experienced to monitor the quality of assessments.

### 3. Learning Facilities

Centres must have access to appropriate learning facilities, which include:

- ✓ **Classrooms:** Modern classrooms equipped with multimedia tools to deliver engaging theoretical instruction on structural design, construction methods, and sustainable engineering practices.
- ✓ **Practical Areas:** Hands-on training areas with advanced equipment for material testing, surveying instruments, concrete mixing, and structural analysis, providing practical experience in real-world civil engineering applications.
- ✓ **Technology Access:** High-performance computers with industry-standard software (e.g., AutoCAD, STAAD.Pro, Revit, and GIS tools) and reliable internet connectivity for drafting, modelling, and project management tasks.

### 4. Health and Safety Compliance

- ✓ Centres must ensure that practical training environments comply with relevant health and safety regulations.
- ✓ Risk assessments must be conducted regularly to maintain a safe learning environment.

### 5. Resource Requirements

- ✓ Learning Materials: Approved course manuals, textbooks, and study guides aligned with the curriculum.
- ✓ Assessment Tools: Templates, guidelines, and resources for conducting and recording assessments.
- ✓ E-Learning Systems: If offering online or hybrid learning, centres must provide a robust Learning Management System (LMS) to facilitate remote delivery.

### 6. Assessment and Quality Assurance

- ✓ Centres must adhere to ICTQual's assessment standards, ensuring that all assessments are fair, valid, and reliable.
- ✓ Internal quality assurance (IQA) processes must be in place to monitor assessments and provide feedback to assessors.
- ✓ External verification visits from ICTQual will ensure compliance with awarding body standards.

### 7. Learner Support

- ✓ Centres must provide learners with access to guidance and support throughout the program, including:
- ✓ Academic support for coursework.
- ✓ Career guidance for future progression.
- ✓ Additional support for learners with specific needs (e.g., disabilities or language barriers).

### 8. Policies and Procedures

Centres must maintain and implement the following policies, as required by ICTQual:

- ✓ Equal Opportunities Policy.
- ✓ Health and Safety Policy.
- ✓ Safeguarding Policies and Procedures.
- ✓ Complaints and Appeals Procedure.
- ✓ Data Protection and Confidentiality Policy.

### 9. Regular Reporting to ICTQual

- ✓ Centres must provide regular updates to ICTQual AB on learner enrolment, progress, and completion rates.
- ✓ Centres are required to maintain records of assessments and learner achievements for external auditing purposes.

## Support for Candidates

Centres should ensure that materials developed to support candidates:

- ✓ Facilitate tracking of achievements as candidate's progress through the learning outcomes and assessment criteria.
- ✓ Include information on how and where ICTQual's policies and procedures can be accessed.

- ✓ Provide mechanisms for Internal and External Quality Assurance staff to verify and authenticate evidence effectively.

This approach ensures transparency, supports candidates' learning journeys, and upholds quality assurance standards.

## Assessment

This qualification is competence-based, requiring candidates to demonstrate proficiency as defined in the qualification units. The assessment evaluates the candidate's skills, knowledge, and understanding against the set standards. Key details include:

### 1. Assessment Process:

- ✓ Must be conducted by an experienced and qualified assessor.
- ✓ Candidates compile a portfolio of evidence that satisfies all learning outcomes and assessment criteria for each unit.

### 2. Types of Evidence:

- ✓ Observation reports by the assessor.
- ✓ Assignments, projects, or reports.
- ✓ Professional discussions.
- ✓ Witness testimonies.
- ✓ Candidate-produced work.
- ✓ Worksheets.
- ✓ Records of oral and written questioning.
- ✓ Recognition of Prior Learning (RPL).

### 3. Learning Outcomes and Assessment Criteria:

- **Learning Outcomes:** Define what candidates should know, understand, or accomplish upon completing the unit.
- **Assessment Criteria:** Detail the standards candidates must meet to demonstrate that the learning outcomes have been achieved.

This framework ensures rigorous and consistent evaluation of candidates' competence in line with the qualification's objectives.

## Unit Descriptors

### CE0004 -1: Construction Technology and Materials

The aim of this study unit is to provide learners with a comprehensive understanding of the properties, applications, and performance of construction materials commonly used in civil engineering. This unit emphasizes the principles of material selection, evaluation, and testing, fostering the ability to assess their impact on construction sustainability, efficiency, and overall project success.

Learning Outcome:	Assessment Criteria:
<p><b>1. Identify and explain the properties and applications of various construction materials (e.g., concrete, steel, timber, and composites) used in civil engineering.</b></p>	<p>1.1. Demonstrate a comprehensive understanding of the properties of concrete, steel, timber, and composites used in civil engineering.</p> <p>1.2. Accurately identify and describe the key physical and mechanical properties of construction materials.</p> <p>1.3. Effectively explain the suitability of different materials for specific civil engineering applications.</p> <p>1.4. Provide evidence of knowledge regarding the advantages and limitations of each material in real-world construction scenarios.</p> <p>1.5. Apply critical thinking to assess the performance of materials under varying environmental and load conditions.</p> <p>1.6. Show an in-depth understanding of the selection criteria for materials in different stages of civil engineering projects.</p>
<p><b>2. Evaluate material performance based on factors such as durability, cost, and suitability for different types of construction projects.</b></p>	<p>2.1 Analyse the durability of materials in relation to environmental and structural factors.</p> <p>2.2 Assess the cost-effectiveness of materials while considering long-term performance and maintenance needs.</p> <p>2.3 Evaluate the suitability of materials for various types of construction projects, considering project scope and requirements.</p> <p>2.4 Critically compare the performance of materials based on industry standards and codes.</p> <p>2.5 Investigate the impact of material choice on project timelines and overall budget.</p> <p>2.6 Demonstrate the ability to make informed decisions about material selection based on performance, cost, and project demands.</p>
<p><b>3. Understand and apply construction technology techniques, including modern methods of construction and material testing processes.</b></p>	<p>3.1 Demonstrate knowledge of current construction technology and modern methods of construction.</p>



	<p>3.2 Apply construction techniques to practical scenarios, considering material properties and project requirements.</p> <p>3.3 Evaluate the effectiveness of modern construction methods in comparison to traditional techniques.</p> <p>3.4 Conduct material testing processes in line with industry standards and regulations.</p> <p>3.5 Analyse the benefits and limitations of various construction technologies in different project contexts.</p> <p>3.6 Integrate construction technology knowledge into decision-making for optimal project outcomes.</p>
<p><b>4. Assess the impact of material choice on the sustainability and efficiency of a construction project.</b></p>	<p>4.1 Evaluate the environmental impact of material choices, considering factors like resource use, emissions, and waste.</p> <p>4.2 Analyse the long-term sustainability of materials in relation to lifecycle performance and disposal.</p> <p>4.3 Assess the efficiency of materials in terms of construction time, cost, and overall project performance.</p> <p>4.4 Investigate the impact of material selection on energy consumption during both construction and building use.</p> <p>4.5 Compare the sustainability credentials of alternative materials, considering industry standards and certifications.</p> <p>4.6 Make recommendations for materials that optimise both sustainability and project efficiency based on thorough assessment.</p>

**CE0004 -2: Structural Mechanics and Design**

The aim of this study unit is to provide learners with a foundational understanding of structural mechanics principles and their application in designing safe and efficient structures. It focuses on developing the skills required to analyse forces, calculate loads, and design structural systems while adhering to industry standards. By completing this unit, learners will gain the ability to assess structural stability and implement solutions to enhance the safety and resilience of various construction projects.

Learning Outcome:	Assessment Criteria:
<p><b>1. Apply basic principles of structural mechanics to understand how forces (e.g., tension, compression, shear, bending) affect structures.</b></p>	<ul style="list-style-type: none"> <li>1.1. Demonstrate a clear understanding of the fundamental forces (tension, compression, shear, bending) acting on structures.</li> <li>1.2. Apply principles of structural mechanics to analyse the behaviour of materials under different loading conditions.</li> <li>1.3. Assess how forces influence the stability and integrity of various structural components.</li> <li>1.4. Use basic calculations to determine the impact of forces on structural elements such as beams, columns, and slabs.</li> <li>1.5. Identify and explain the relationships between applied forces and resulting deformations or stresses in structures.</li> <li>1.6. Integrate the application of structural mechanics principles into the design and evaluation of simple structures.</li> </ul>
<p><b>2. Perform load calculations for structural components such as beams, columns, and foundations, considering factors like dead loads, live loads, and environmental forces.</b></p>	<ul style="list-style-type: none"> <li>2.1 Apply relevant formulas and principles to calculate the load distribution on structural components such as beams, columns, and foundations.</li> <li>2.2 Accurately calculate dead loads, live loads, and environmental forces acting on structural elements.</li> <li>2.3 Analyse the effects of load combinations on the performance and safety of structural components.</li> <li>2.4 Integrate factors such as material properties and load-bearing capacity in load calculation processes.</li> <li>2.5 Consider the influence of environmental forces, including wind, seismic, and thermal loads, on structural integrity.</li> <li>2.6 Ensure compliance with industry standards and regulations when performing load calculations for various structural components.</li> </ul>
<p><b>3. Design simple structural systems following</b></p>	<ul style="list-style-type: none"> <li>3.1 Apply relevant design codes and standards</li> </ul>

<p><b>relevant codes and standards to ensure safety and efficiency in the construction of buildings and infrastructure.</b></p>	<p>to ensure the structural integrity and safety of buildings and infrastructure.</p> <p>3.2 Demonstrate the ability to design simple structural systems that meet functional and safety requirements.</p> <p>3.3 Consider factors such as material properties, load-bearing capacity, and environmental conditions in design decisions.</p> <p>3.4 Use industry-standard software or manual methods to perform structural calculations and design optimised solutions.</p> <p>3.5 Ensure that the design process addresses both the efficiency and sustainability of the structural system.</p> <p>3.6 Evaluate the final design against safety, performance, and cost-effectiveness criteria, ensuring compliance with all regulatory requirements.</p>
<p><b>4. Assess structural stability and propose solutions to mitigate risks or weaknesses in structures.</b></p>	<p>4.1 Identify potential risks or weaknesses in structures through thorough assessment of stability and load distribution.</p> <p>4.2 Apply structural analysis techniques to evaluate the impact of various forces on the stability of a structure.</p> <p>4.3 Propose effective solutions to mitigate risks, such as reinforcement, redesign, or material substitution.</p> <p>4.4 Consider both short-term and long-term performance when assessing structural stability.</p> <p>4.5 Integrate safety and compliance with regulatory standards in the proposed solutions for risk mitigation.</p> <p>4.6 Evaluate the cost-effectiveness and practicality of proposed solutions, ensuring minimal disruption to project timelines.</p>

**CE0004 -3: Site Surveying and Geotechnics**

The aim of this study unit is to equip learners with the essential skills and knowledge needed to effectively conduct site surveys and analyse soil conditions for civil engineering projects. This unit will enable students to proficiently use surveying instruments such as total stations, levels, and GPS to collect accurate site data. It will also help them interpret topographical maps and site plans to guide engineering decisions and design.

<b>Learning Outcome:</b>	<b>Assessment Criteria:</b>
<p><b>1. Use surveying instruments (e.g., total stations, levels, GPS) to measure and record site data accurately.</b></p>	<ul style="list-style-type: none"> <li>1.1. Demonstrate proficiency in the use of surveying instruments such as total stations, levels, and GPS to collect accurate site data.</li> <li>1.2. Accurately measure distances, angles, and elevations using the appropriate surveying equipment for different site conditions.</li> <li>1.3. Record and interpret data collected from surveying instruments in a clear and precise manner.</li> <li>1.4. Ensure that measurements are taken in accordance with industry standards and project specifications.</li> <li>1.5. Analyse and correct any errors or discrepancies in measurements to maintain data accuracy.</li> <li>1.6. Apply surveying techniques to support the planning, design, and construction phases of projects.</li> </ul>
<p><b>2. Interpret topographical maps and site plans to inform engineering decisions and project design.</b></p>	<ul style="list-style-type: none"> <li>2.1 Accurately read and interpret topographical maps and site plans, identifying key features and elevations.</li> <li>2.2 Analyse the spatial relationships between natural and man-made elements on maps and plans.</li> <li>2.3 Use map data to inform engineering decisions related to site layout, drainage, and foundation design.</li> <li>2.4 Apply knowledge of scale, contour lines, and symbols to make informed design choices.</li> <li>2.5 Ensure alignment with project goals by considering environmental, regulatory, and technical factors from the maps.</li> <li>2.6 Integrate topographical and site plan information into the broader project design, ensuring accuracy and feasibility.</li> </ul>
<p><b>3. Understand and analyse soil properties, including soil types, compaction, and bearing capacity, for appropriate foundation design.</b></p>	<ul style="list-style-type: none"> <li>3.1 Identify and classify different soil types and their characteristics relevant to foundation design.</li> <li>3.2 Analyse soil compaction and its effects on the stability and load-bearing capacity of</li> </ul>

	<p>foundations.</p> <p>3.3 Evaluate the bearing capacity of soil to ensure suitability for supporting structural loads.</p> <p>3.4 Assess the impact of soil conditions, including moisture content and density, on foundation performance.</p> <p>3.5 Apply soil property data to select the most appropriate foundation type for specific site conditions.</p> <p>3.6 Integrate soil analysis into the overall foundation design process, ensuring safety and long-term stability.</p>
<p><b>4. Apply geotechnical principles in the assessment of site conditions and in making recommendations for foundation types and soil treatments.</b></p>	<p>4.1 Apply geotechnical principles to assess site conditions, including soil composition, groundwater levels, and potential risks.</p> <p>4.2 Use soil analysis results to make informed recommendations for appropriate foundation types based on site conditions.</p> <p>4.3 Evaluate the need for soil treatments, such as compaction, grouting, or stabilisation, to improve soil properties for foundation support.</p> <p>4.4 Consider environmental, structural, and regulatory factors when making foundation and soil treatment recommendations.</p> <p>4.5 Integrate geotechnical data into the design process, ensuring compatibility with the overall project requirements.</p> <p>4.6 Provide clear, evidence-based recommendations that enhance the stability, safety, and cost-effectiveness of foundations.</p>

**CE0004 -4: Health, Safety, and Environmental Practices**

The aim of this study unit is to equip learners with the essential knowledge and skills required to ensure health, safety, and environmental standards are maintained on construction and civil engineering projects. The unit focuses on understanding and applying health and safety regulations to protect workers and the public, as well as implementing effective risk management strategies to minimize hazards.

<b>Learning Outcome:</b>	<b>Assessment Criteria:</b>
<p><b>1. Understand and apply health and safety regulations within construction and civil engineering projects to protect workers and the public.</b></p>	<ul style="list-style-type: none"> <li>1.1. Demonstrate a thorough understanding of relevant health and safety regulations in construction and civil engineering projects.</li> <li>1.2. Apply health and safety principles to identify and mitigate potential hazards on construction sites.</li> <li>1.3. Ensure compliance with national and international safety standards and guidelines in project planning and execution.</li> <li>1.4. Implement risk assessments and safety protocols to protect workers and the public during all stages of construction.</li> <li>1.5. Monitor and enforce the use of personal protective equipment (PPE) and safety measures on site.</li> <li>1.6. Promote a culture of safety through ongoing training, awareness, and reporting of health and safety concerns.</li> </ul>
<p><b>2. Implement risk management strategies to minimize hazards on construction sites, ensuring compliance with local and international safety standards.</b></p>	<ul style="list-style-type: none"> <li>2.1. Identify potential hazards on construction sites through thorough risk assessments and site inspections.</li> <li>2.2. Develop and implement risk management strategies to mitigate identified hazards and ensure worker safety.</li> <li>2.3. Ensure compliance with local and international safety standards, regulations, and industry best practices.</li> <li>2.4. Continuously monitor and evaluate the effectiveness of risk management strategies throughout the project lifecycle.</li> <li>2.5. Provide training and guidance to workers on risk awareness, safe practices, and emergency procedures.</li> <li>2.6. Review and update risk management plans regularly to address new or emerging hazards during construction.</li> </ul>
<p><b>3. Promote sustainable practices within civil engineering projects by assessing environmental impacts and recommending mitigation strategies.</b></p>	<ul style="list-style-type: none"> <li>3.1 Assess the environmental impacts of civil engineering projects, including effects on air, water, soil, and biodiversity.</li> </ul>

	<ul style="list-style-type: none"> <li>3.2 Identify key sustainability challenges and opportunities within a project’s lifecycle, from planning to execution.</li> <li>3.3 Recommend mitigation strategies to reduce negative environmental impacts, such as resource conservation, waste management, and pollution control.</li> <li>3.4 Incorporate sustainable materials and technologies into project design and construction processes.</li> <li>3.5 Ensure compliance with environmental regulations and industry sustainability standards.</li> <li>3.6 Promote the integration of environmental considerations into decision-making, encouraging long-term sustainability throughout the project.</li> </ul>
<p><b>4. Recognize and apply environmental laws and guidelines in construction projects to reduce the ecological footprint of civil engineering practices.</b></p>	<ul style="list-style-type: none"> <li>4.1. Understand and interpret relevant environmental laws, guidelines, and regulations that impact construction projects.</li> <li>4.2. Apply environmental laws to ensure compliance with local, national, and international standards in civil engineering practices.</li> <li>4.3. Integrate environmental considerations into project planning, design, and construction to reduce ecological impacts.</li> <li>4.4. Promote sustainable practices such as waste minimisation, energy efficiency, and the use of environmentally friendly materials.</li> <li>4.5. Monitor and evaluate environmental performance throughout the project lifecycle, ensuring adherence to environmental standards.</li> <li>4.6. Advocate for continuous improvement in environmental practices, reducing the ecological footprint of civil engineering projects.</li> </ul>

**CE0004 -5: Project Management Fundamentals**

The aim of this study unit is to provide learners with essential project management skills necessary for successfully planning, executing, and monitoring civil engineering projects. This unit focuses on developing the ability to create detailed project schedules, allocate resources effectively, and manage project costs within budget.

<b>Learning Outcome:</b>	<b>Assessment Criteria:</b>
<p><b>1. Apply basic project management principles to plan, execute, and monitor civil engineering projects effectively.</b></p>	<ul style="list-style-type: none"> <li>1.1. Understand and apply basic project management principles, including scope, time, and cost management, to civil engineering projects.</li> <li>1.2. Develop comprehensive project plans, outlining objectives, timelines, resources, and milestones for effective execution.</li> <li>1.3. Monitor project progress, identifying any deviations from the plan and implementing corrective actions as needed.</li> <li>1.4. Coordinate resources, including personnel, materials, and equipment, to ensure project tasks are completed efficiently.</li> <li>1.5. Manage project risks by identifying potential issues early and applying risk mitigation strategies.</li> <li>1.6. Communicate effectively with stakeholders, ensuring that project goals, progress, and challenges are clearly understood throughout the project lifecycle.</li> </ul>
<p><b>2. Develop project schedules and timelines, allocating resources (e.g., labour, materials, equipment) efficiently to meet deadlines and budgets.</b></p>	<ul style="list-style-type: none"> <li>2.1 Create detailed project schedules and timelines, outlining key tasks, milestones, and deadlines.</li> <li>2.2 Allocate resources efficiently, ensuring proper distribution of labour, materials, and equipment across project phases.</li> <li>2.3 Monitor project progress against the established schedule, adjusting timelines and resource allocation as necessary to meet deadlines.</li> <li>2.4 Ensure that resources are utilised optimally, minimising waste and downtime while maintaining productivity.</li> <li>2.5 Assess project costs regularly, ensuring alignment with the budget and making adjustments to avoid overruns.</li> <li>2.6 Communicate any schedule or resource changes promptly to stakeholders, ensuring clear understanding of impacts on project delivery.</li> </ul>
<p><b>3. Monitor project costs and understand financial management techniques, including cost</b></p>	<ul style="list-style-type: none"> <li>3.1 Monitor and track project costs, ensuring they align with the established budget and</li> </ul>



<p>estimation, budgeting, and controlling project expenditures.</p>	<p>financial goals.</p> <p>3.2 Apply cost estimation techniques to accurately predict project expenses for labour, materials, equipment, and overheads.</p> <p>3.3 Develop and maintain a project budget, allocating funds to various tasks and phases based on priorities and resource requirements.</p> <p>3.4 Control project expenditures by identifying and addressing cost overruns or inefficiencies in real-time.</p> <p>3.5 Analyse financial performance and make data-driven decisions to keep the project within budget while maintaining quality and scope.</p> <p>3.6 Communicate financial updates to stakeholders, providing transparent reports on cost status, potential risks, and mitigation strategies.</p>
<p><b>4. Assess and manage risks in civil engineering projects, implementing mitigation strategies to minimize delays or budget overruns.</b></p>	<p>4.1. Monitor and track project costs, ensuring they align with the established budget and financial goals.</p> <p>4.2. Apply cost estimation techniques to accurately predict project expenses for labour, materials, equipment, and overheads.</p> <p>4.3. Develop and maintain a project budget, allocating funds to various tasks and phases based on priorities and resource requirements.</p> <p>4.4. Control project expenditures by identifying and addressing cost overruns or inefficiencies in real-time.</p> <p>4.5. Analyse financial performance and make data-driven decisions to keep the project within budget while maintaining quality and scope.</p> <p>4.6. Communicate financial updates to stakeholders, providing transparent reports on cost status, potential risks, and mitigation strategies.</p>

**CE0004 -6: Civil Engineering Drawing and CAD**

The aim of this study unit is to equip students with the skills and knowledge required to create precise technical drawings and designs for civil engineering projects using both traditional methods and modern Computer-Aided Design (CAD) software. This unit aims to develop students' ability to interpret complex engineering plans, understand key dimensions and specifications, and produce high-quality design documentation that is essential for planning, permitting, and construction.

Learning Outcome:	Assessment Criteria:
<p><b>1. Create accurate technical drawings of civil engineering designs using traditional drawing methods and modern CAD (Computer-Aided Design) software.</b></p>	<ul style="list-style-type: none"> <li>1.1. Demonstrates proficiency in utilising both traditional drawing methods and modern CAD software to produce accurate technical drawings.</li> <li>1.2. Accurately interprets civil engineering designs and translates them into technical drawings with precision.</li> <li>1.3. Exhibits the ability to create detailed technical drawings that conform to industry standards and project specifications.</li> <li>1.4. Shows understanding of scale, dimensions, and proportion in technical drawing processes.</li> <li>1.5. Effectively applies CAD software tools to enhance the accuracy, efficiency, and clarity of technical drawings.</li> <li>1.6. Consistently produces high-quality, error-free technical drawings suitable for construction and engineering purposes.</li> </ul>
<p><b>2. Interpret complex engineering plans and drawings, identifying key components, dimensions, and specifications.</b></p>	<ul style="list-style-type: none"> <li>2.1 Accurately interprets complex engineering plans and drawings, identifying key components, dimensions, and specifications.</li> <li>2.2 Demonstrates a comprehensive understanding of engineering symbols, notations, and terminology used in technical drawings.</li> <li>2.3 Identifies and extracts relevant information from plans, ensuring correct interpretation of project requirements.</li> <li>2.4 Assesses the relationships between different components in engineering designs to ensure alignment with specifications.</li> <li>2.5 Effectively highlights critical dimensions and specifications necessary for the construction or implementation of engineering projects.</li> <li>2.6 Applies knowledge of engineering standards and practices to ensure precise interpretation of technical drawings.</li> </ul>
<p><b>3. Use CAD software to design, modify, and visualize</b></p>	<p>3.1 Demonstrates proficiency in using CAD</p>

<p><b>civil engineering structures such as roads, bridges, and drainage systems.</b></p>	<p>software to design, modify, and visualise civil engineering structures such as roads, bridges, and drainage systems.</p> <p>3.2 Effectively applies CAD tools to create accurate, detailed representations of civil engineering designs.</p> <p>3.3 Shows ability to modify existing CAD designs, ensuring updates align with project specifications and engineering standards.</p> <p>3.4 Utilises CAD software to visualise complex civil engineering structures, allowing for comprehensive design evaluation.</p> <p>3.5 Integrates relevant engineering data and specifications into CAD software for accurate and functional design outcomes.</p> <p>3.6 Consistently produces high-quality, editable CAD designs suitable for further development and construction implementation.</p>
<p><b>4. Produce clear and detailed design documentation that can be used for project planning, permitting, and construction.</b></p>	<p>4.1 Produces clear and comprehensive design documentation that aligns with project planning, permitting, and construction requirements.</p> <p>4.2 Demonstrates attention to detail in ensuring that all necessary design elements are included and properly documented.</p> <p>4.3 Ensures that design documentation is accurate, with clear annotations, dimensions, and specifications for ease of interpretation.</p> <p>4.4 Adheres to industry standards and regulatory requirements when preparing design documentation for project approval and construction.</p> <p>4.5 Effectively communicates design intent through organised and professionally presented documentation.</p> <p>4.6 Delivers well-structured design documentation that supports successful project execution, including permitting and construction phases.</p>

## ICTQual AB

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