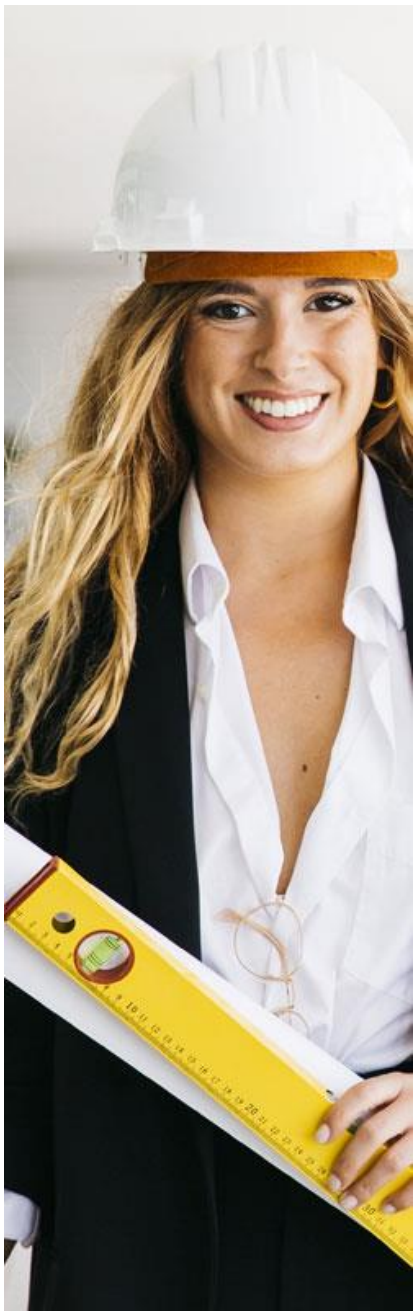

LEVEL 5 DIPLOMA IN CIVIL ENGNEERING

Online Course | Tutor is available to students | Qualification listed on OfQual website

44-7388826841

+44-203-608-0338

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Live chat, visit www.LSPM.org.uk

UK Provider Reference Number (UKPRN) : 10063255

Duration: 6 Months / 9 Months

Fees: GBP £1250 / GBP £950

Credits	Awarding body	Delivery mode
120	OTHM,UK	Online

Contents

Unit Summary

Unit title	**Design of Structural elements**
EduQual level	Level 5
Unit aim	Learners will be able to identify, describe and explain the structural materials.
Essential resources	It is available from library, database or journal, brochures, case studies, debates,news release, videos, editorials,instruction manuals, internet and intranet,management plans, Vancouver or harvard referencing systems, discussion posts,power point presentations
Delivery and assessment	Tutoring and advising should not be rigid and cater to the needs of students. Regular guidance through direct or online will clear the required theoretical knowledge. To guide students work independently or in groups, analyzing and accumulating datas on the subject. Individual and collective research, case studies, simulations, exercises and debates are distinctive and winsome ways of learning about the different types of consensus. Students probably use tutor cum autonomous study that reflect know-how and proficiency. For latest information and materials updations are available at relevant websites and various Medias. Additional assessment guidance is provided on the sample assignment brief.

Learning Outcome 1: Understand how to identify the factors that affect the design of structural elements			
Assessment criteria **On completion of this unit, the learner can**	**Indicative content**	**Delivery**	**Assessment**
1.1 Identify the materials used for structural elements **1.2** Describe the sources of information that provide guidance on factors that affect the use of materials.	Structural material:- Meaning, Common Structural material like Iron, concrete, aluminium, composites etc., Uses of structural materials, Effect of structural materials on construction of the building. Factors:-, Recyclable, Availability, Easy installation, Durability, Health Safety, Sources of Information- Meaning, Types, Use and Effect.	https://en.wikipedia.org/wiki/Structural_material http://www.monitor.co.ug/Magazines/HomesandProperty/Factors-building-materials-waste/689858-4075668-xdh4c1z/index.html http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.200.7286&rep=rep1&type=pdf http://karibouconnections.net/medlibafrica/training_module/16.html http://www.constructionhistory.co.uk/sources-information-construction-history/	
Learning Outcome 2: Be able to know how the factors affect the design of structural elements			
Assessment criteria *On completion of this unit, the learner can:*	**Indicative content**	**Delivery**	**Assessment**

2.1 Explain how the factors affect the design of steel beams, steel columns and slabs and built up bases	Factors Affecting the design:- Loads from building, Type of soil, Types of structure in neighbourhood, Types of foundations, Zoning & Permitting issues, Geography & climate, Site selection, Sustainability and Energy efficient, Features and accessories.	https://theconstructor.org/geotechnical/factors-affecting-selection-of-foundation-for-buildings/10504/ https://www.whirlwindsteel.com/blog/bid/391065/5-factors-that-can-affect-your-steel-building-design	
2.2 Explain how the factors affect the design of reinforced concrete slabs, beams and columns	Reinforced concrete:- Meaning, Constructional Aspects, Utilization Aspects, Reliability Analysis.	https://www.witpress.com/Secure/elibrary/papers/RISK00/RISK00035FU.pdf	
2.3 Explain the factors that affect the design of masonry walls.	Masonry:- Meaning, Advantages & Disadvantages of using it, Structural Safety, Basic design Considerations, Foundations, Reinforced and Prestressed masonry.	https://www.slideshare.net/khentot74/design-of-masonry-structures-2004	

2.4 Explain the factors that affect the design of timber beams and columns.	Introduction, Design methods- Permissible design, Load factor design, Limit state design, Beam deflections.	http://www.roymech.co.uk/Useful_Tables/Timber/Timber_Strength_Calcs.html	
Learning Outcome 3: Understand the design process of structural elements according to specification.			
Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
3.1 Design steel beams and columns to agreed Specifications. **3.2** Design slabs and built up bases to agreed Specifications **3.3** Design reinforced concrete slabs, beams and columns to agreed specifications **3.4** Carry out the design of	Building regulation, Eurocodes introduction, Limit of design, BS EN 1990, Eurocode for Steel structures. Introduction, Standard Hot-rolled sections and regulations , Compound sections, effect of regulation on the design. Reinforced Concrete Beams & Columns:- Meaning, Types, use, Leglations and law used for specifications.	https://www.steelconstruction.info/Design_codes_and_standards https://www.designingbuildings.co.uk/wiki/Structural_steelwork https://www.slideshare.net/prabhatchhirolya/beams-and-columns https://www.designingbuildings.co.uk/wiki/Cavity_wall	

solid and cavity masonry walls to agreed specifications **3.5** Carry out the design of timber joists and struts to agreed specifications	Masonry walls:- Introduction, History, penetrating damp, Insulation, Vapour barrier. Specifications:- Joists meaning, Struts meaning, Basic requirements for stability, Sizes of certain timber floor, ceiling and roof.	https://www.designingbuildings.co.uk/wiki/Joist https://www.designingbuildings.co.uk/wiki/Herringbone_strut http://www.buildingcontrol-ni.com/assets/pdf/D1994.pdf	

List of Learner Resources

Textbooks
• http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.200.7286&rep=rep1&type=pdf • https://www.witpress.com/Secure/elibrary/papers/RISK00/RISK00035FU.pdf • http://www.buildingcontrol-ni.com/assets/pdf/D1994.pdf
Journals
Websites
• https://en.wikipedia.org/wiki/Structural_material • http://karibouconnections.net/medlibafrica/training_module/16.html • http://www.constructionhistory.co.uk/sources-information-construction-history/ • http://www.monitor.co.ug/Magazines/HomesandProperty/Factors-building-materials-waste/689858-4075668-xdh4c1z/index.html • https://theconstructor.org/geotechnical/factors-affecting-selection-of-foundation-for-buildings/10504/ • https://www.whirlwindsteel.com/blog/bid/391065/5-factors-that-can-affect-your-steel-building-design • https://www.slideshare.net/khentot74/design-of-masonry-structures-2004 • http://www.roymech.co.uk/Useful_Tables/Timber/Timber_Strength_Calcs.html • https://www.steelconstruction.info/Design_codes_and_standards

- https://www.designingbuildings.co.uk/wiki/Structural_steelwork
- https://www.slideshare.net/prabhatchhirolya/beams-and-columns
- https://www.designingbuildings.co.uk/wiki/Cavity_wall
- https://www.designingbuildings.co.uk/wiki/Joist
- https://www.designingbuildings.co.uk/wiki/Herringbone_strut

Unit Summary

Unit title	**Environmental water engineering**
EduQual level	Level 5
Total Qualification Time (Hours)	60
Unit aim	Learners will be able to do comparision between different forms of junction and sewage treatments.
Essential resources	It is available from library, database or journal, brochures, case studies, debates,news release, videos, editorials,instruction manuals, internet and intranet,management plans, Vancouver or harvard referencing systems, discussion posts,power point presentations
Delivery and assessment	Tutoring and advising should not be rigid and cater to the needs of students. Regular guidance through direct or online will clear the required theoretical knowledge. To guide students work independently or in groups, analyzing and accumulating datas on the subject. Individual and collective research, case studies, simulations, exercises and debates are distinctive and winsome ways of learning about the different types of consensus. Students probably use tutor cum autonomous study that reflect know-how and proficiency. For latest information and materials updations are available at relevant websites and various Medias. Additional assessment guidance is provided on the sample assignment brief.

Learning Outcome 1: Be able know about laws and legislation governing water and wastewater

Assessment criteria On completion of this unit, the learner can	Indicative content	Delivery	Assessment
1.1 Define and explain the legislation on water quality.	Water quality:- The Environment Act 1995, The evnvironmental Protection Act 1990, The water Act 1972, The control of Pollution Act 1990, The Food and Environment protection Act 1985, The water resources Act 1991, The radioactive substances Act 1993, Regulations in September 1997.	http://www.ukmarinesac.org.uk/activities/water-quality/wq1_2.htm	
1.2 Describe various laws and regulations on wastewater.	Legislations:- National legislislation, Subsequent Legislation, European legislation, Coverage Areas of the legislation.	https://www.ofwat.gov.uk/regulated-companies/ofwat-industry-overview/legislation/ https://www.legislation.gov.uk/uksi/1994/2841/contents/made	

Learning Outcome 2: Understand and recognise the nature of sewage and sewerage systems.

Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
2.1 Explain the characteristics of sewage.	Characteristics:- Sewage definition, Physical characteristics, Chemical characteristics, Biological characteristics, Examples.	https://www.slideshare.net/RamprasadKumawat1/characteristics-of-sewage	

2.2 Differentiate between various sewerage systems 2.3 Explain the risks or hazards invoved when working with sewage and sewerage systems.	Sewerage systems:- Principles, Types- Combined, Separate, Simplified, Solid free, Pressurised, Vaccum, Open channel drains. Risks:- Who is at risk, Sewage meaning, Health risks, Protecting workers.	https://flovac.com/how-vacuum-sewerage-works/comparing-vacuum-sewer-systems-with-low-pressure-and-gravity-systems/ https://ocw.un-ihe.org/pluginfile.php/440/mod_resource/content/1/Urban_Drainage_and_Sewerage/1_Introduction/Types%20of%20sewer%20systems/Type_of_sewer_systems.pdf http://www.hse.gov.uk/pubns/indg198.pdf	

Learning Outcome 3: Understand and recognize the sewage and sewerage systems

Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
3.1 Explain in detail about sewage flows. 3.2 Choose the best size for sewer in relance to the factors.	Sewage flows:- Sewage flow rates for design units, Flows per bedroom for homes, Daily design flow rates, Flow reduction for design flows. Sewerage systems:- Scope, design standards, Requirement, Enhancement, Case Study or example.	https://ehs.ncpublichealth.com/oet/docs/cit/oswpmod/wastewaterCharcFlow.pdf https://www.dsd.gov.hk/EN/Files/Technical_Manual/technical_manuals/Sewerage_Manual_1_Eurocodes.pdf	

Learning Outcome 4: Be able to learn water treatment			
Assessment criteria On completion of this unit, the learner can:	**Indicative content**	**Delivery**	**Assessment**
4.1 Discuss the range of water characteristics	Water characteristics:- Physical, Chemical and Biological, Meaning, Impacts and Uses, Examples.	https://theconstructor.org/environmental-engg/characteristics-of-water-physical-chemical-biological/4735/	
4.2 Desbribe various water treatment systems.	Water treatment systems:- Carbon filtration, Distillation, Ozone, Reverse osmosis, Sand filtration , Sediment filtration, Neutralising filtration, Ultra-violet sterilisation.	http://www.mwqa.com/consumer-information/types-of-water-treatment-systems/	
4.3 List out and explain all the steps taken for water treatment.		http://dwi.defra.gov.uk/private-water-supply/installations/Treatment-processes.pdf https://en.wikipedia.org/wiki/Water_treatment	
4.4 Discuss the influence of factors on the design of sedimentation tanks.	Steps taken:- Introduction, Sedimentation, Filtration, Aeration, Chemical treatment, Membrane	https://en.wikipedia.org/wiki/Sedimentati	

4.5 Choose the best disinfectants to ensure water safety for consumption process. 4.6 List out all the characteristics and criteria for choosing disinfectants for drinking water 4.7 Discuss various types of wastes produced as the result of water treatment 4.8 List and explain the potential Health and Safety risks when working in a water treatment site.	Processes, Disinfection. Sedimentation tanks:- Water treatment, Treatment processes, Water Handling, Factors affecting the design. Disinfectants:- Meaning, Importance, Uses, Types, Control measures, Examples. Characteristics for selection:- The necessity or importance, Application area, Source, Number of users, Diagrams and examples.	on_(water_treatment) http://www.nesc.wvu.edu/pdf/dw/publications/ontap/2009_tb/disinfection_DWFSOM50.pdf https://www.gov.mb.ca/waterstewardship/odw/reg-info/approvals/odw_chlorine_and_alternative_disinfectants.pdf http://www.fao.org/wairdocs/lead/x6114e/x6114e07.htm https://www.slideshare.net/dphorowitz/safety-for-water-treatment-plant-facilities	

	Types of water:- Introduction, By-products - Solid waste, wastewater, Volatile compounds, Disposal of the waste. Risks:- Meaning, Sources of risks,Assess the risk, Control measures.		

Learning Outcome 5: Be able to understand theprinciples of wastewater treatment

Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
5.1 Discuss all the types of processess that are used in wastewater treatment with relevance to quantity and quality	Waste water treatment:- Identify the problem, Treatment Process- Preliminary, Primary, Secondary, Tertiary, Disinfection, Storage, Effectiveness; Natural treatment- Stabilization Ponds, Overland treatment, Macrophyte Treatment, Nutrient Film Technique.	http://www.fao.org/docrep/t0551e/t0551e05.htm	
5.2 Explain various sources of sludge	Sludge:- Meaning, Sources, Characteristics, Quantities,Examples.	http://mimoza.marmara.edu.tr/~orhan.gokyay/enve425/ch2.pdf	

5.3 Explain various sludge treatment processes. 5 .4 Discuss the routes followed for disposal of sludge.	Sludge Treatment:- Classification of sludge, Sludge Treatment- Thickening, Stabilization, Dehydration, Natural Systems, Diagrams. Sludge Disposal Routes:- Laws regarding Sluge generation and treatment, Landfill disposal, Incineration, Use in agriculture, Use in silviculture, Land Reclamation, Use in green areas.	https://blog-en.condorchem.com/sludge-treatment/#.WzMRotVKi1s http://ec.europa.eu/environment/archives/waste/sludge/pdf/sludge_disposal1a.pdf	

List of Learner Resources

Textbooks
• https://ocw.un-ihe.org/pluginfile.php/440/mod_resource/content/1/Urban_Drainage_and_Sewerage/1_Introduction/Types%20of%20sewer%20systems/Type_of_sewer_systems.pdf • http://www.hse.gov.uk/pubns/indg198.pdf • https://ehs.ncpublichealth.com/oet/docs/cit/oswpmod/wastewaterCharcFlow.pdf • https://www.dsd.gov.hk/EN/Files/Technical_Manual/technical_manuals/Sewerage_Manual_1_Eurocodes.pdf • http://dwi.defra.gov.uk/private-water-supply/installations/Treatment-processes.pdf • http://www.nesc.wvu.edu/pdf/dw/publications/ontap/2009_tb/disinfection_DWFSOM50.pdf • https://www.gov.mb.ca/waterstewardship/odw/reg-info/approvals/odw_chlorine_and_alternative_disinfectants.pdf • http://mimoza.marmara.edu.tr/~orhan.gokyay/enve425/ch2.pdf • http://ec.europa.eu/environment/archives/waste/sludge/pdf/sludge_disposal1a.pdf
Journals
• https://blog-en.condorchem.com/sludge-treatment/#.WzMRotVKi1s
Websites
• http://www.ukmarinesac.org.uk/activities/water-quality/wq1_2.htm • https://www.ofwat.gov.uk/regulated-companies/ofwat-industry-overview/legislation/ • https://www.legislation.gov.uk/uksi/1994/2841/contents/made • https://www.slideshare.net/RamprasadKumawat1/characteristics-of-sewage • https://flovac.com/how-vacuum-sewerage-works/comparing-vacuum-sewer-systems-with-low-pressure-and-gravity-systems/

- https://theconstructor.org/environmental-engg/characteristics-of-water-physical-chemical-biological/4735/
- http://www.mwqa.com/consumer-information/types-of-water-treatment-systems/
- https://en.wikipedia.org/wiki/Water_treatment
- https://en.wikipedia.org/wiki/Sedimentation_(water_treatment)
- http://www.fao.org/wairdocs/lead/x6114e/x6114e07.htm
- https://www.slideshare.net/dphorowitz/safety-for-water-treatment-plant-facilities
- http://www.fao.org/docrep/t0551e/t0551e05.htm

Unit Summary

Unit title	Measurement, costing and contracts for civil engineers
EduQual level	Level 5
Total Qualification Time (Hours)	60
Unit aim	Learners will be able understand and explain the measurement, tendering and estimating procedures.
Essential resources	It is available from library, database or journal, brochures, case studies, debates,news release, videos, editorials,instruction manuals, internet and intranet,management plans, Vancouver or harvard referencing systems, discussion posts,power point presentations
Delivery and assessment	Tutoring and advising should not be rigid and cater to the needs of students. Regular guidance through direct or online will clear the required theoretical knowledge. To guide students work independently or in groups, analyzing and accumulating datas on the subject. Individual and collective research, case studies, simulations, exercises and debates are distinctive and winsome ways of learning about the different types of consensus. Students probably use tutor cum autonomous study that reflect know-how and proficiency. For latest information and materials updations are available at relevant websites and various Medias. Additional assessment guidance is provided on the sample assignment brief.

Learning Outcome 1: Understand the principles of measurement, tendering and estimating			
Assessment criteria On completion of this unit, the learner can	**Indicative content**	**Delivery**	**Assessment**
1.1 List and explain the tendering procedures in use for civil engineering works.	Tendering:- Conventional Tendering Process- Pre-tendering Process, Clarification, Submission, Settlement, Contract, Public Projects, Two stage tendering, Construction Management, Management Contracts.	https://www.designingbuildings.co.uk/wiki/Typical_tender_process_for_construction_projects	
1.2 Explain the cost estimation procedure used in civil engineering works.	Cost estimation:- Definition, Key Components, Process for creating Project Cost estimate, The continum of Accuracy, Techniques, Methods.	https://www.smartsheet.com/ultimate-guide-project-cost-estimating	

Learning Outcome 2: Be able to measure civil engineering work from issued drawings and specifications			
Assessment criteria On completion of this unit, the learner can:	**Indicative content**	**Delivery**	**Assessment**
2.1 Explain the standard methods of measurement of civil engineering works. 2.2 Explain the process to prepare "Bills of Quantities".	Civil Engineering:- Scope of measurement, Principles, Measurement Practice, Types of measurement Methods- CESMM3- Classes A-D, E, F-H, I-L,M-O, P-Q, R-T, U-W, X-Z. Examples. Bill Of Quantities (BOQ):- Introduction, Standards for BOQ, Preparing BOQ, Approximate BOQ, Examples or case studies.	https://www.researchgate.net/publication/259193612_A_comparison_between_CESMM3_and_MCHW_as_methods_of_measurement_for_Civil_Engineering_Work https://www.macmillanihe.com/resources/sample-chapters/9780333800744_sample.pdf https://www.designingbuildings.co.uk/wiki/Bill_of_quantities_BOQ	

Learning Outcome 3: Be able to learn the method for processing tenders.			
Assessment criteria On completion of this unit, the learner can:	**Indicative content**	**Delivery**	**Assessment**
3.1 Discuss various types of tender contracts. 3.2 List and explain various methods of tendering. 3.3 List and explain the process of documentation in tendering process. 3.4 Discuss in detail the process for tendering for civil engineering works. 3.5 Explain the procedure for tender procurement.	Tender Contracts:- Meaning, Types:- Open, Selective, Two stage selection, Negotiation, Term Tender, Use, Advantages and Disadvantages of each type. Tendering Types:- Scope, Use, Open Tending, Selective tendering, Negotiation tendering, Examples of types. Documents:- Tender definition, Range of Documentation, Importance, Scope, Documents Required. Tendering Process:- Introduction, Procedure in UK, Estimator's Role, Problems, Solutions. Tender Procurement:- Form Procurement Team, Develop Tender & Evaluation Criteria, POQ, Issue tender, Tender Briefing meeting,Initial	https://www.ukessays.com/essays/construction/types-of-tenders-and-tendering-process-construction-essay.php https://theconstructor.org/construction/types-of-tendering-methods-in-construction/6372/ https://www.designingbuildings.co.uk/wiki/Tender_documentation_for_construction_projects http://www.essay.uk.com/free-essays/business/contractor-document-tendering-process.php https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/486902/20150409-FOI2015_03688_MOD_tender_evalution_documents_ten	

	Evaluation, Supplier Shortlist, Presentation, Interview& Visits, Selection, Negotiation, Contract Award,	https://www.zemaitis-uk.com/tender-procurement-process/ https://europa.eu/youreurope/business/public-tenders/rules-procedures/index_en.htm	

Learning Outcome 4: **Understand the process of producing a tender documentation**			
Assessment criteria On completion of this unit, the learner can:	**Indicative content**	**Delivery**	**Assessment**
4.1 Plan a proposal for tender for civil engineering works.	Tender:- Notice of tender, Instruction to Bidders, Bid Form, Sample Form, Examples.	https://www.inf.gov.nt.ca/sites/inf/files/resources/construction_tender.docx_0.pdf http://www.infoentrepreneurs.org/en/guides/tender-for-a-contract/	
4.2 Explain the requirements in tender documentation.	Tender Documentation:- PQQs & tender documents, Preparing tender documentation, Tender submitting.	https://www.executivecompass.co.uk/resources/bid-writing/producing-quality-tender-document/	

Learning Outcome 5: Understand the process of producing an estimate			
Assessment criteria On completion of this unit, the learner can:	**Indicative content**	**Delivery**	**Assessment**
5.1 State and explain "All-in rates' for civil engineering works.	All-in-rates:- Definition, General inclusion, Processes, Calculation, Numerical Example, Solution.	http://learnquantitysurveying.com/2017/08/12/all-in-labor-rates/?i=1 https://www.slideshare.net/alihyder790/rates-analysis	
5.2 Discuss in detail the cost estimation procedure in civil engineering works.	Cost estimation:- Importance, Meaning, Preparation, Cooperative projects, Total Project Cost estimation, Contingencies, Cash flows.	https://lincoln.ne.gov/city/pworks/engine/dconst/gpp/pdf/costest.pdf	

List of Learner Resources

Textbooks
• https://www.macmillanihe.com/resources/sample-chapters/9780333800744_sample.pdf • https://www.inf.gov.nt.ca/sites/inf/files/resources/construction_tender.docx_0.pdf • https://lincoln.ne.gov/city/pworks/engine/dconst/gpp/pdf/costest.pdf
Journals
Websites
• https://www.designingbuildings.co.uk/wiki/Typical_tender_process_for_construction_projects • https://www.smartsheet.com/ultimate-guide-project-cost-estimating • https://www.researchgate.net/publication/259193612_A_comparison_between_CESMM3_and_MCHW_as_methods_of_measurement_for_Civil_Engineering_Work • https://www.designingbuildings.co.uk/wiki/Bill_of_quantities_BOQ

- https://www.ukessays.com/essays/construction/types-of-tenders-and-tendering-process-construction-essay.php
- https://theconstructor.org/construction/types-of-tendering-methods-in-construction/6372/
- https://www.designingbuildings.co.uk/wiki/Tender_documentation_for_construction_projects
- http://www.essay.uk.com/free-essays/business/contractor-document-tendering-process.php
- https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/486902/20150409-FOI2015_03688_MOD_tender_evalution_documents_ten
- https://www.zemaitis-uk.com/tender-procurement-process/
- https://europa.eu/youreurope/business/public-tenders/rules-procedures/index_en.htm
- http://www.infoentrepreneurs.org/en/guides/tender-for-a-contract/
- https://www.executivecompass.co.uk/resources/bid-writing/producing-quality-tender-document/
- http://learnquantitysurveying.com/2017/08/12/all-in-labor-rates/?i=1
- https://www.slideshare.net/alihyder790/rates-analysis

Unit Summary

Unit title	Personal and Professional development
EduQual level	Level 5
Total Qualification Time (Hours)	60
Unit aim	Learners will be able to recognise and explain the advantages of personal and professional development.
Essential resources	It is available from library, database or journal, brochures, case studies, debates,news release, videos, editorials,instruction manuals, internet and intranet,management plans, Vancouver or harvard referencing systems, discussion posts,power point presentations
Delivery and assessment	Tutoring and advising should not be rigid and cater to the needs of students. Regular guidance through direct or online will clear the required theoretical knowledge. To guide students work independently or in groups, analyzing and accumulating datas on the subject. Individual and collective research, case studies, simulations, exercises and debates are distinctive and winsome ways of learning about the different types of consensus. Students probably use tutor cum autonomous study that reflect know-how and proficiency. For latest information and materials updations are available at relevant websites and various Medias. Additional assessment guidance is provided on the sample assignment brief.

Learning Outcome 1: Be able to learn the process of planning personal and professional development			
Assessment criteria On completion of this unit, the learner can	**Indicative content**	**Delivery**	**Assessment**
1.1 Explain various benefits of personal and professional development.	Personal development:- Meaning, How to track it, Benefits- Clear goals, Motivation, Work-life balance, Improved careere prospects. Professional development:- Meaning, Benefits:- Increase retention, Build confidence & credibility, easier succession planning, Reenergising staff, Improved efficiency.	https://www.reed.co.uk/career-advice/five-benefits-of-personal-development/ https://www.kaplanfinancial.com/resources/pdc/5-benefits-of-professional-development/	
1.2 Recognise various opportunities for career and personal development.	Development opportunities:- Personal development meaning, Progress files, Benefits of Personal development in professional life, Benefits to personal life, Priorities & opportunities for personal development, Career Growth & Development opportunities, Tips for growth.	https://www.thebalancecareers.com/improving-career-development-4058289 https://www.macmillanihe.com/studentstudyskills/page/About-personal-development/	
1.3 Evaluate various opportunities for development that supports career and personal progression.	Professional development:- Continue education, Participation, Research, Improve job performance, Increased duties and responsibilities. Personal development:- Be patient, Think critically, Listen, Healthy coping with stress, Challenge your limits, Make better choice, Be active, Less procastinating, Be confident, Face your fears, Be resilient,	https://hr.buffalostate.edu/professional-development-examples https://www.examples.com/business/examples-of-personal-development-goals.html	
Learning Outcome 2: Be able to know how people learn			

Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
2.1 Discuss the principles of learning by people.	Introduction, Principles:- How information is presented, How information is obtained, How information is perceived, How information is processed and understand, How information is organised or ordered, How the information is applied.	http://thepeakperformancecenter.com/educational-learning/learning/principles-of-learning/	
2.2 Explain various learning styles.	Learning styles:- Linguistic, Naturalist, Rhythmi, Kinesthetic,Visual/ Spatial, Logical/ Mathematical, Interpersonal, Intra personal.	https://www.skillsyouneed.com/rhubarb/fingerprints-learning-styles.html	
2.3 Analyse different learning resources that supports development.	Evaluate:- Quantity v/s Quality, Tools- MERLOT, LORI, Microsoft Evaluators Guide, Natonal council for educaton technology for evaluating CD-DROM.	https://www.slideshare.net/DamianGordon1/evaluation-of-learning-resources	
2.4 Evaluate various learning strategies and their uses.	Learning strategies:- Definitions, Source Definitions, Classification, Researches on learning strategies, Relationship of learnng strategy and learnng style,Case study or examples.	https://www.ukessays.com/essays/linguistics/learning-strategies-and-stylesresubmit-word.php	

Learning Outcome 3 **Understand the process of making plans for personal and professional development**			
Assessment criteria On completion of this unit, the learner can:	**Indicative content**	**Delivery**	**Assessment**
3.1 Plan and implement the self-audit process in relevance with skills and experience. 3.2 List and explain different methods of tracking personal development	Self Audit:- Introduction, Definition, Resources, How to Audit, Audit Form, Unexpected insights. Track Personal Development:- Facts & Figures, Stay on plan, Keep a record, Checklists, Rate your progress, Tools:- Strides, Pareto Analysis, HabitBull, Penzu, Trello,	https://startstoday.hsbc.com.au/career/self-audit-how-to-recognise-and-develop-your-personal-skills/ https://www.bradford.ac.uk/academic-skills/media/academicskillsadvice/documents/academicskillsresources/personaldevelopmentplanninggoalsettingandsapra/Skills-for-University-Self-Audit.docx. https://www.coachingpositiveperformance.com/measure-your-progress-stay-track-goals/ https://www.yearon.com/blog/online-self-development-tools	

Learning Outcome 4: **Understand the process of making recommendations for personal and professional development**			
Assessment criteria On completion of this unit, the learner can:	**Indicative content**	**Delivery**	**Assessment**
4.1 Discuss various benefits of reflective practice. 4.2 Analyse the progress against development plan.	Reflective Practice:- Meaning, Benefits- Think deeply, Rational decision making, Promotes honesty, Creates opportunities, Acts as safeguard, Disadvantages.	www.northderbyshireccg.nhs.uk/.../Benefits_and_risks_of_reflective_practice.docx https://www.slideshare.net/Celcius233/reflective-practice-27714069	

4.3 Suggest different opportunities for continous development.	Progress:- Monitoring, Reasons to monitor, Topics to monitor, Effective Monitoring, Evaluation, Reasons to evaluate, Approach to evaluate. Continuous Development:- Meaning, Purpose, Training, Key features, Benefits, Starting Point, What supervisors can do, Motivation for development.	https://www.doc.govt.nz/get-involved/run-a-project/community-project-guidelines/monitor-and-evaluate-progress/ https://www.jobs.ac.uk/careers-advice/managing-your-career/1318/what-is-continuing-professional-development-cpd https://hr.berkeley.edu/performance/performance-management/cycle/motivate	

List of Learner Resources

Textbooks
Journals
Websites

- https://www.reed.co.uk/career-advice/five-benefits-of-personal-development/
- https://www.kaplanfinancial.com/resources/pdc/5-benefits-of-professional-development/
- https://www.thebalancecareers.com/improving-career-development-4058289
- https://www.macmillanihe.com/studentstudyskills/page/About-personal-development/
- https://hr.buffalostate.edu/professional-development-examples
- https://www.examples.com/business/examples-of-personal-development-goals.html
- http://thepeakperformancecenter.com/educational-learning/learning/principles-of-learning/
- https://www.skillsyouneed.com/rhubarb/fingerprints-learning-styles.html
- https://www.slideshare.net/DamianGordon1/evaluation-of-learning-resources
- https://www.ukessays.com/essays/linguistics/learning-strategies-and-stylesresubmit-word.php
- https://startstoday.hsbc.com.au/career/self-audit-how-to-recognise-and-develop-your-personal-skills/
- https://www.bradford.ac.uk/academic-skills/media/academicskillsadvice/documents/academicskillsresources/personaldevelopmentplanninggoalsettingandsapra/Skills-for-University-Self-Audit.docx.
- https://www.coachingpositiveperformance.com/measure-your-progress-stay-track-goals/

- https://www.yearon.com/blog/online-self-development-tools
- www.northderbyshireccg.nhs.uk/.../Benefits_and_risks_of_reflective_practice.docx
- https://www.slideshare.net/Celcius233/reflective-practice-27714069
- https://www.doc.govt.nz/get-involved/run-a-project/community-project-guidelines/monitor-and-evaluate-progress/
- https://www.jobs.ac.uk/careers-advice/managing-your-career/1318/what-is-continuing-professional-development-cpd
- https://hr.berkeley.edu/performance/performance-management/cycle/motivate

Unit Summary

Unit title	PROJECT MANAGEMENT
EduQual level	Level 5
Total Qualification Time (Hours)	60
Unit aim	Learners will be able to define and discuss the principles of project.
Essential resources	It is available from library, database or journal, brochures, case studies, debates,news release, videos, editorials,instruction manuals, internet and intranet,management plans, Vancouver or harvard referencing systems, discussion posts,power point presentations
Delivery and assessment	Tutoring and advising should not be rigid and cater to the needs of students. Regular guidance through direct or online will clear the required theoretical knowledge. To guide students work independently or in groups, analyzing and accumulating datas on the subject. Individual and collective research, case studies, simulations, exercises and debates are distinctive and winsome ways of learning about the different types of consensus. Students probably use tutor cum autonomous study that reflect know-how and proficiency. For latest information and materials updations are available at relevant websites and various Medias. Additional assessment guidance is provided on the sample assignment brief.

Learning Outcome 1: Be able to find reasons for the use of project management in the organisation.			
Assessment criteria On completion of this unit, the learner can	Indicative content	Delivery	Assessment
1.1 Describe the principles of project Management. 1.2 Explain the benefits of project management to organisations and individuals.	Principles of Project Management:- Vision & Mission, Business Objectives, Standards of Engagement, Intervention & Execution Strategy, Organisational Allignment, Measurement and Accountability. Project management:- Meaning, Advantages of using Project Management, Benefits to individuals, Benefits for organisation.	https://www.projectsmart.co.uk/the-six-principles-of-project-management.php https://www.nibusinessinfo.co.uk/content/basic-principles-project-management http://www.projectaccelerator.co.uk/ten-benefits-of-good-project-management/ http://2020projectmanagement.com/resources/project-management-training-and-qualifications/what-are-the-benefits-of-achieving-a-project-management-qualification-or-certification	
Learning Outcome 2: Be able to learn the process of setting up projects.			
Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
2.1 Explain the considerations that apply when reviewing project proposals	Considerations:- Purpose, Impact, Costs, Execution, Assessment, Risks, Strategic fit, Corporate Considerations, Risk & Impact Assessment.	https://evolllution.com/revenue-streams/market_opportunities/six-key-considerations-for-innovative-proposals/ https://community2.newcastle.gov.uk/projects/content/stage-2-project-proposal	

2.2 Explain how to set clear goals for projects.	Goal setting:- Importance, Before you start, Setting goals:- Specific, Measurable, Achievable, Relevant, Timely; Achieving your goals.	https://www.business.gov.au/news/how-to-set-goals-and-objectives-for-your-business https://www.projectsmart.co.uk/10-steps-to-setting-smart-objectives.php	
2.3 Analyse project resource requirements	Resources:- Use, Inputs to resource planning, Resource estimation, Acquisition, Leveling, Human resource planning, Allocation.	https://www.peterjoubert.com/resource-requirements/	
2.4 Explain how roles and responsibilities are allocated within project teams.	Roles and Responsibiities Allocation:- Project Team Meaning, Importance of assigning roles, 3 role- Leader, Member, Contributor, Responsibilities, Organisational Chart.	http://smallbusiness.chron.com/importance-establishing-assigning-responsibilities-project-team-members-18128.html https://mymanagementguide.com/basics/project-team-organization-project-team-definition-responsibilities-and-roles-and-project-team-organization-chart/	
2.5 Identify project communication needs	Project Communication:- Communication Definition, Importance, Major Elements, What, How and When to communicate, Tools and Techniques.	https://www.projectsmart.co.uk/the-importance-of-communication-in-project-management.php https://www.projectsmart.co.uk/project-communications-how-to-keep-your-team-engaged-and-informed.php	
2.6 Assess possible risks to successful completion of projects	Risks assessment:- Identification, Understand, Probabilities, Avoidance, Mitigation, Back- up Plans. Types of risk:- Cost, Schedule, Performance, Governance, Strategic, Operational, Market, Legal, External Hazards.		

2.7 Explain how to mitigate possible risks.	Risk mitigation Process:- Define Risk Mitigation, Process- Clarify Requirements, Get the right team, Spread the risk, Communicate and Listen, Assess feasibility, Test everything, Have Back-up plan.	https://www.activia.co.uk/blog/7-tips-on-how-to-do-a-risk-assessment-for-a-project https://project-management.com/types-of-risk-in-project-management/ https://www.strategyex.co.uk/blog/pmoperspectives/7-ways-to-mitigate-risk-on-projects/	

Learning Outcome 3: Understand the process of using management tools to maintain, control and monitor projects.			
Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
3.1 Describe different management tools for monitoring and control of projects	Project management tools:- Grant Chart, Logic Network, PERT Chart, Product Breakdown Structure, Work Breakdown Structure; SWOT, RACI, Stakeholder Matrix, Cause & Effect Diagram, Risk Map, Decision Tree, Radar Chart.	https://www.projectsmart.co.uk/project-management-tools.php https://www.finance-ni.gov.uk/articles/programme-and-project-management-tools-and-techniques	
3.2 Justify the use of management tools for monitoring and controlling projects	Importance:- Estimating, Planning & Tracking, Assigning & Scheduling Resources.	https://bizfluent.com/info-8320824-importance-project-management-tools.html	

Learning Outcome 4: Understand the process of reviewing the projects at all stages.			
Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
4.1 Explain reasons for reviewing projects after completion	Importance for Project Review:- Meaning of Post project Review, Elements of good review, Importance of Post review, Case study or examples.	https://waset.org/publications/10003262/the-importance-of-project-post-implementation-reviews https://www.projectmanager.com/blog/post-implementation-review http://proposalsforngos.com/proposals/whats-the-difference-project-plan-vs-project-proposal/ https://yourbusiness.azcentral.com/difference-between-project-proposal-project-outline-17682.html	

4.2 Review projects against original proposals.	Reviewing:- Meaning, Process, When to Review, What to review, How to Review, Methods; Compare Project and proposal.		

List of Learner Resources

Textbooks
Journals
• https://www.activia.co.uk/blog/7-tips-on-how-to-do-a-risk-assessment-for-a-project • https://www.projectmanager.com/blog/post-implementation-review
Websites
• https://www.projectsmart.co.uk/the-six-principles-of-project-management.php • https://www.nibusinessinfo.co.uk/content/basic-principles-project-management • http://www.projectaccelerator.co.uk/ten-benefits-of-good-project-management/ • http://2020projectmanagement.com/resources/project-management-training-and-qualifications/what-are-the-benefits-of-achieving-a-project-management-qualification-or-certification • https://evolllution.com/revenue-streams/market_opportunities/six-key-considerations-for-innovative-proposals/ • https://community2.newcastle.gov.uk/projects/content/stage-2-project-proposal • https://www.business.gov.au/news/how-to-set-goals-and-objectives-for-your-business • https://www.projectsmart.co.uk/10-steps-to-setting-smart-objectives.php • https://www.peterjoubert.com/resource-requirements/ • http://smallbusiness.chron.com/importance-establishing-assigning-responsibilities-project-team-members-18128.html • https://mymanagementguide.com/basics/project-team-organization-project-team-definition-responsibilities-and-roles-and-project-team-organization-chart/ • https://www.projectsmart.co.uk/the-importance-of-communication-in-project-management.php • https://www.projectsmart.co.uk/project-communications-how-to-keep-your-team-engaged-and-informed.php • https://project-management.com/types-of-risk-in-project-management/ • https://www.strategyex.co.uk/blog/pmoperspectives/7-ways-to-mitigate-risk-on-projects/ • https://www.projectsmart.co.uk/project-management-tools.php • https://www.finance-ni.gov.uk/articles/programme-and-project-management-tools-and-techniques • https://bizfluent.com/info-8320824-importance-project-management-tools.html • https://waset.org/publications/10003262/the-importance-of-project-post-implementation-reviews • http://proposalsforngos.com/proposals/whats-the-difference-project-plan-vs-project-proposal/ • https://yourbusiness.azcentral.com/difference-between-project-proposal-project-outline-17682.html

Unit Summary

Unit title	Role of Concrete and Water
EduQual level	Level 5
Total Qualification Time (Hours)	60
Unit aim	Learners will be able to explain different types of concrete and role of water.
Essential resources	It is available from library, database or journal, brochures, case studies, debates,news release, videos, editorials,instruction manuals, internet and intranet,management plans, Vancouver or harvard referencing systems, discussion posts,power point presentations
Delivery and assessment	Tutoring and advising should not be rigid and cater to the needs of students. Regular guidance through direct or online will clear the required theoretical knowledge. To guide students work independently or in groups, analyzing and accumulating datas on the subject. Individual and collective research, case studies, simulations, exercises and debates are distinctive and winsome ways of learning about the different types of consensus. Students probably use tutor cum autonomous study that reflect know-how and proficiency. For latest information and materials updations are available at relevant websites and various Medias. Additional assessment guidance is provided on the sample assignment brief.

Learning Outcome 1: **Understand different types and constituents of concrete**			
Assessment criteria On completion of this unit, the learner can	Indicative content	Delivery	Assessment
1.1 Explain various types ofconcrete.	Types of Concrete:- Meaning, Types- Normal weight, High strength, High Performance, Pervious, Air-Entrained, Light weight, Self-Compacting, Their Strength and Uses.	https://en.wikipedia.org/wiki/Types_of_concrete http://www.misterconcrete.co.uk/news-case-studies-post/blog-posts/brief-explanation-of-types-of-concrete-and-where-to-use-them	
1.2 Explain the types of constituents of concrete.	Constituents of concrete:- Basic constituents-Cement, Water, Aggregates, Cement & Additions, Admixtures, Fibres.	https://www.hanson.co.uk/en/technical-information/concrete-constituents https://www.slideshare.net/mahzuz-ceesust/lecture-2-constituents-of-concretecement	
1.3 Review the effect of fineness and chemical composition of cement on the properties of concrete.	Concrete Properties:- Fineness of cement, Effect of fineness on cement properties, Chemical Composition of Cement, Effect of chemical composition on concrete properties.	http://www.concreteconstruction.net/how-to/cement-fineness_o https://civiltoday.com/civil-engineering-materials/cement/10-cement-ingredients-with-functions https://www.tandfonline.com/doi/pdf/10.3846/1392-3730.2009.15.317-324	
1.4 Explain how the properties of aggregates affect concrete.	Aggregates:- Meaning, Properties- Size, Shape, Moisture contents, Specific gravity, Density, etc, Effect on concrete- Strength and Durability.	http://www.engr.psu.edu/ce/courses/ce584/concrete/library/materials/aggregate/aggregatesmain.htm https://theconstructor.org/concrete/effects-of-aggregate-properties-on-concrete/5555/	

1.5 Discuss what is the role ofwater used in concrete.	Role of Water:- Concrete Meaning, Requirement of water, Hydration, Water/Cement Ratio and Strength, Workability of Concrete(Admixtures), Durability of concrete, Sprayed Concrete.	https://www.slideshare.net/NarendraGoud/water-in-concrete http://mycivil.engineer/importance-of-water-in-concrete/	
1.6 Differentiate between the effects that various admixtures produce on concrete.	Admixtures:- Definition, Importance, Uses, Types, Effect of different types on Concrete, Result, Examples.	https://www.tandfonline.com/doi/abs/10.1080/03602559708000666?journalCode=lpte20	
1.7 State the necessity of tests and teh process that are used to determine the properties of concrete and its constituent parts.	Importance of tests:- Meaning and importance of tests, Reasons- To know Strength and elasticity, To know hardness of finished material, Testing Tools:- Thermometers, Rulers, Magnifying glasses, Cameras.	http://www.scanman.com.au/newsletter/may10/composition-of-concrete-and-importance-of-concrete-testing.html https://www.slideshare.net/EdtilLacuna/the-importance-of-proper-concrete-testing-methods https://www.dot.state.mn.us/materials/manuals/concrete/Chapter5.pdf http://www.cedd.gov.hk/eng/publications/standards_handbooks_cost/doc/stan_cs1/CS1-2010%20Vol%202%20Rev%2000-101130.pdf	

Learning Outcome 2: Be able learn the practices of concrete			
Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
2.1 Explain the procedure used for Concrete production.	Cement production:- Essential Components of cement, Types, Materials Used, Cement substitutes, Manufacturiing Process, Diagram.	http://www.greenspec.co.uk/building-design/cement-materials-and-manufacturing-process/	
2.2 List and describe various factors that are considered in the reinforcement of concrete.	Reinforced Concrete:- Definition of Concrete and Reinforced Concrete, Where to use it, Benefits, Sustainable Solution.	https://www.explainthatstuff.com/steelconcrete.html https://www.hanson.co.uk/en/concrete/reinforced-concrete	
2.3 Explain the use of concrete plants and equipment used in concrete making.	Concrete Plants- Tilting-Drum Mixtures, Non-Tilting Drum Mixtures, Reverse drum Mixtures, Paddle mixtures, Transporting Mixtures. Concrete Equipments- Concrete Batching Plants, Concrete Pum, Automatic Concrete Machine, Semi-Automatic Concrete Machine, Pipe Casting machines, Portable plant, Concrete Recycling plant.	https://www.designingbuildings.co.uk/wiki/Concreting_plant https://www.masterbuilder.co.in/concreting-equipment-infrastructure/	
2.4 List and describe the factors considered in the use of formwork and false work in concreting.	Formwork:- Definition, Scope, Uses, Requirements of formwork. Falsework:- Definition, Scope, Uses, Requirements of falsework.	https://en.wikipedia.org/wiki/Formwork https://en.wikipedia.org/wiki/Falsework https://www.istructe.org/fibuk/files/fib_bull48_nmg.pdf	

2.5 Discuss the best practices of health and safety to be followed when concreting.	Health and Safety practices:- Managing Health & Safety, Organising the site, Excavations, Working at height, Moving, Lifting and Handling Loads, Site Vehicles and mobile plant, Chemicals, Protective equipment, Emergency Procedures.	http://labour.govmu.org/English/Documents/Code%20of%20Practice/guidelines/5.%20Guidelines%20for%20Safety%20and%20Health%20on%20Construction%20Sites.pdf https://www.osha.gov/Publications/concrete_manufacturing.html	

Learning Outcome 3: **Understand the proces of designing concrete mixes.**

Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
3.1 Differentiate between methods used to design concrete mixes in accordance with standards.	Concrete design:- Meaning, Objectives, Basic considerations, Factorsinfluencing choice of mix design, Standard design.	http://civil.emu.edu.tr/courses/civl284/8%20mix%20design%20calculations.pdf https://www.slideshare.net/gauravhtandon1/concrete-mix-design-46415349	
3.2 Plan a design for a concrete mix with specified parameters.	Design:- Data collection, Target mean strength, Water/cement Ratio, Water content Calculation, Cement content, Weight of total Aggregate, weight of fine Aggregate, Combination of aggregates, Proportions, Adjustment, Final Design Proportion.	http://www.sginstitute.in/Downloads/Civil_Downloads/LectureNo_19.pdf	

Learning Outcome 4: **Be able to learn the process of maintaining pavements.**

Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
4.1 Discuss what is the purpose of road condition Surveys.	Road condition:- Source, Definitions, Specific Issues, Statistical Conventions, Technical Terms.	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/674582/road-conditions-notes.pdf	
4.2 Discuss what are the reasons for pavement failure.	Pavement Failure:- Meaning, Types- Sub-grade, Sub-base course, Base course, Surface course.	https://theconstructor.org/transportation/types-failures-in-flexible-pavements-repair/16124/	

4.3 Propose varoius techniques for improvement of the pavement.	Pavements Improvements:- Meaning, Importance, Benefits, Methods- Routine maintainance, Crack sealing, Patching, etc.	http://civilblog.org/2015/09/18/10-different-types-of-failures-of-flexible-pavement/ https://www.slideshare.net/TalaviyaMalay/pavement-failures https://suresealpavement.com/blog/different-types-of-pavement-preservation-treatments/	

List of Learner Resources

Textbooks
• https://www.dot.state.mn.us/materials/manuals/concrete/Chapter5.pdf • http://www.cedd.gov.hk/eng/publications/standards_handbooks_cost/doc/stan_cs1/CS1-2010%20Vol%202%20Rev%2000-101130.pdf • https://www.istructe.org/fibuk/files/fib_bull48_nmg.pdf • http://labour.govmu.org/English/Documents/Code%20of%20Practice/guidelines/5.%20Guidelines%20for%20Safety%20and%20Health%20on%20Construction%20Sites.pdf • http://civil.emu.edu.tr/courses/civl284/8%20mix%20design%20calculations.pdf • http://www.sginstitute.in/Downloads/Civil_Downloads/LectureNo_19.pdf • https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/674582/road-conditions-notes.pdf
Journals
Websites
• https://en.wikipedia.org/wiki/Types_of_concrete • http://www.misterconcrete.co.uk/news-case-studies-post/blog-posts/brief-explanation-of-types-of-concrete-and-where-to-use-them • https://www.hanson.co.uk/en/technical-information/concrete-constituents • https://www.slideshare.net/mahzuz-ceesust/lecture-2-constituents-of-concretecement • http://www.concreteconstruction.net/how-to/cement-fineness_o • https://civiltoday.com/civil-engineering-materials/cement/10-cement-ingredients-with-functions • https://www.tandfonline.com/doi/pdf/10.3846/1392-3730.2009.15.317-324 • http://www.engr.psu.edu/ce/courses/ce584/concrete/library/materials/aggregate/aggregatesmain.htm • https://theconstructor.org/concrete/effects-of-aggregate-properties-on-concrete/5555/ • https://www.slideshare.net/NarendraGoud/water-in-concrete • http://mycivil.engineer/importance-of-water-in-concrete/ • https://www.tandfonline.com/doi/abs/10.1080/03602559708000666?journalCode=lpte20

- http://www.scanman.com.au/newsletter/may10/composition-of-concrete-and-importance-of-concrete-testing.html
- https://www.slideshare.net/EdtilLacuna/the-importance-of-proper-concrete-testing-methods
- http://www.greenspec.co.uk/building-design/cement-materials-and-manufacturing-process/
- https://www.explainthatstuff.com/steelconcrete.html
- https://www.hanson.co.uk/en/concrete/reinforced-concrete
- https://www.designingbuildings.co.uk/wiki/Concreting_plant
- https://www.masterbuilder.co.in/concreting-equipment-infrastructure/
- https://en.wikipedia.org/wiki/Formwork
- https://en.wikipedia.org/wiki/Falsework
- https://www.osha.gov/Publications/concrete_manufacturing.html
- https://www.slideshare.net/gauravhtandon1/concrete-mix-design-46415349
- https://theconstructor.org/transportation/types-failures-in-flexible-pavements-repair/16124/
- http://civilblog.org/2015/09/18/10-different-types-of-failures-of-flexible-pavement/
- https://www.slideshare.net/TalaviyaMalay/pavement-failures
- https://suresealpavement.com/blog/different-types-of-pavement-preservation-treatments/

Unit Summary

Unit title	Sustainable Development
EduQual level	Level 5
Total Qualification Time (Hours)	60
Unit aim	Learners will be able to define and discuss sustainable development
Essential resources	It is available from library, database or journal, brochures, case studies, debates,news release, videos, editorials,instruction manuals, internet and intranet,management plans, Vancouver or harvard referencing systems, discussion posts,power point presentations
Delivery and assessment	Tutoring and advising should not be rigid and cater to the needs of students. Regular guidance through direct or online will clear the required theoretical knowledge. To guide students work independently or in groups, analyzing and accumulating datas on the subject. Individual and collective research, case studies, simulations, exercises and debates are distinctive and winsome ways of learning about the different types of consensus. Students probably use tutor cum autonomous study that reflect know-how and proficiency. For latest information and materials updations are available at relevant websites and various Medias. Additional assessment guidance is provided on the sample assignment brief.

Learning Outcome 1: Be able to know the meaning of sustainability and sustainable development			
Assessment criteria On completion of this unit, the learner can	Indicative content	Delivery	Assessment
1.1 Explain different aims of sustainability.	Aims:- No poverty, Zero hunger, good health & well being, quality education, Gender Equality, Clean Water & Sanitation, ffordable & clean Energy, etc	https://www.gov.uk/government/publications/implementing-the-sustainable-development-goals/implementing-the-sustainable-development-goals	
1.2 Define and Discuss in detail about sustainable development.	Sustainable Development:- Meaning, Range of focus, Scope, Effect on us, implementation Process.	http://www.sd-commission.org.uk/pages/what-is-sustainable-development.html https://en.wikipedia.org/wiki/Sustainable_development	
1.3 Discuss various threats or barriers to sustainability.	Sustainability:- Definition, Threats- Environmental Threats, Population Growth, Urbanisation, Energy use and Global Warming, Water Scarcity, Waste management; Solutions- Solar Chimney, Green Buildings, Intelligent Bulidings, Concrete.	https://www.thestructuralengineer.info/library/papers/Sustainability_Challenges_and_solutions.pdf	
1.4 Discuss the aims of international treaties held on sustainable development.	International Convention & Treaties:- Vienna Convention(Montreal Protocol), Stockholm Conevention, Rotterdam Convention, Basel Convention, Convention on Biological Diversity(Cartagena	http://www.drishtiias.com/upsc-exam-gs-resources-International-Convention-and-Treaties-for-Sustainable-Development	

	Protocol, Nagoya Protocol, Aichi Target), UN convention(KYOTO protocol), Bonn Convention, Barcelona Convention, Ramsar Convention, Minamata Convention, Benzene Convention.		

Learning Outcome 2: Be able to identify importance of environmental issues involved with the management and development of the built environment

Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
2.1 Define and explain the environmental regulation.	Environmental Regulation:- Definition, Principles, International Law, UK environmental Law- meaning, Environmental Protection, European & International law.	https://en.wikipedia.org/wiki/Environmental_law https://en.wikipedia.org/wiki/United_Kingdom_environmental_law	
2.2 Define and explain the environmental policies.	Environmental Policy:- Definition, Rationale, Instruments, Problems & Issues, Research and innovation Policy, Environmental Policy Integration, Environmental Policy Studies.	https://en.wikipedia.org/wiki/Environmental_policy	
2.3 Analyse the methodology of Environmental Impact Assessment (EIA).	EIA methodology:- Data Review, Screening, Scoping, Baseline Surveys, Consultation, Assessment & Iteration, Environmental Statement.	https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010019/TR010019-000267-6-1-ES-Chapters_05-EIA-Process.pdf https://en.wikipedia.org/wiki/Environmental_impact_assessment	
2.4 Describe different principle of Life Cycle Analysis.	Life Cycle Assessment:- Goals & Purpose, Phases, Uses, Data Analysis, Types, Impact.	https://en.wikipedia.org/wiki/Life-cycle_assessment	

2.5 Discuss the Health and Safety regulations which affect the development in environment.	Environmental Health & Safety:- Introduction, Policy, Legislations, Management Commitment, Planning, Implementation, Measurement, Mangement Review, Examples.	http://www.hse.gov.uk/comah/bpgrange/scope/legislat.htm https://www.ncbi.nlm.nih.gov/books/NBK55873/	

Learning Outcome 3: Be able learn the concept of green buildings			
Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
3.1 Discuss the characteristics of Green Buildings.	Features of green building:- Air tightness & Vapor Barrier, Low solar heat gain, Daylight controlled lighting Systems, Occupancy Sensors, Water efficient Fittings, Rain Water Harvesting,Materials Recovery Facility, Vegetation, Site Sustainability.	https://www.greenregister.org.uk/pro-essential https://www.rappler.com/science-nature/environment/56190-ten-features-green-building	
3.2 Discuss various techniques that are used in Green Building Construction.	Techniques:- Location, Smaller is better, Energy Efficient Equipment, Proper insulation, Reduce, Reuse, Recycle, Use Sustainable Building materials, Install Solar Panels, Energy Star Windows, Rain water Harvesting Systems, Eco- Friendly Lighting, etc	https://www.conserve-energy-future.com/top-15-green-home-building-techniques-and-ideas.php	
3.3 Discuss the types of sustainable materials used in construction of green building.	Sustainable materials:- Plan your house, Materials- Timber, Cob, Straw bale, Roofing, Thatch(Reed/Straw), Wooden tiles, Green roofs.	https://www.self-build.co.uk/green-building-techniques/	
3.4 Explain the Health and Safety regulations which impact on green buildings during construction and operation.	Health & Safety:- Green buillding definition, Impact on health & Safety, Considerations For construction Workers, Legislations and their effect.	https://www.alnmag.com/article/2007/12/health-and-safety-when-building-green https://www.designingbuildings.co.uk/wiki/Health_and_safety_for_building_design_and_construction	

List of Learner Resources

Textbooks
• https://www.thestructuralengineer.info/library/papers/Sustainability_Challenges_and_solutions.pdf
Journals
Websites
• https://www.gov.uk/government/publications/implementing-the-sustainable-development-goals/implementing-the-sustainable-development-goals • http://www.sd-commission.org.uk/pages/what-is-sustainable-development.html • https://en.wikipedia.org/wiki/Sustainable_development • http://www.drishtiias.com/upsc-exam-gs-resources-International-Convention-and-Treaties-for-Sustainable-Development • https://en.wikipedia.org/wiki/Environmental_law • https://en.wikipedia.org/wiki/United_Kingdom_environmental_law • https://en.wikipedia.org/wiki/Environmental_policy • https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010019/TR010019-000267-6-1-ES-Chapters_05-EIA-Process.pdf • https://en.wikipedia.org/wiki/Environmental_impact_assessment • https://en.wikipedia.org/wiki/Life-cycle_assessment • http://www.hse.gov.uk/comah/bpgrange/scope/legislat.htm • https://www.ncbi.nlm.nih.gov/books/NBK55873/ • https://www.greenregister.org.uk/pro-essential • https://www.rappler.com/science-nature/environment/56190-ten-features-green-building • https://www.conserve-energy-future.com/top-15-green-home-building-techniques-and-ideas.php • https://www.self-build.co.uk/green-building-techniques/ • https://www.alnmag.com/article/2007/12/health-and-safety-when-building-green • https://www.designingbuildings.co.uk/wiki/Health_and_safety_for_building_design_and_construction

Unit Summary

Unit title	**Transport Engineering**
EduQual level	Level 5
Total Qualification Time (Hours)	60
Unit aim	Learners will be able to understand the geometric designs of junctions.
Essential resources	It is available from library, database or journal, brochures, case studies, debates,news release, videos, editorials,instruction manuals, internet and intranet,management plans, Vancouver or harvard referencing systems, discussion posts,power point presentations
Delivery and assessment	Tutoring and advising should not be rigid and cater to the needs of students. Regular guidance through direct or online will clear the required theoretical knowledge. To guide students work independently or in groups, analyzing and accumulating datas on the subject. Individual and collective research, case studies, simulations, exercises and debates are distinctive and winsome ways of learning about the different types of consensus. Students probably use tutor cum autonomous study that reflect know-how and proficiency. For latest information and materials updations are available at relevant websites and various Medias. Additional assessment guidance is provided on the sample assignment brief.

Learning Outcome 1: **Be able to know the designing process of road junctions**			
Assessment criteria On completion of this unit, the learner can	Indicative content	Delivery	Assessment
1.2 Differentiate between various forms of junction.	Types of Junction:- Introduction, Junction type, Selection, Examples.	http://www.tiipublications.ie/library/DN-GEO-03060-01.pdf	
1.2 Describe various reliable and safe geometric designs of junctions in relevance with the national Standards.	Geometric designs:- Purpose, Legislations, Effect, Road and safety Hierarchy, Examples.	https://www.newcastle.gov.uk/sites/default/files/wwwfileroot/legacy/regen/plantrans/DesignAndConstructionOfRoadsAndAccessesToAdoptableStandardsMarch2011.pdf	
1.3 Explain the process calculating the junction capacities	Junction capacities:- Introduction, Basic characteristics, UK empirical method, Mathematical calculation, Applications.	https://trlsoftware.co.uk/library/files/documents/ARCADY_UK%20Empirical%20Methodology.pdf	
1.4 Explain the process of optimising the signal timings for better traffic networks.	Optimise signal timings:- Introduction, Problem setting, Derivation of estimators, Numerical results, Results.	http://onlinepubs.trb.org/onlinepubs/conferences/2011/RSS/2/Stevanovic,Al.pdf http://scholar.rhsmith.umd.edu/sites/default/files/mfu/files/hf06.pdf	
Learning Outcome 2: **Be able to learn transport policy**			
Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
2.1 Discuss in detail the transport regulation specific to UK.	UK transport regulation:- Present laws, History, Offences, Motor Vehicle Offences,	https://en.wikipedia.org/wiki/United_Kingdom_traffic_laws https://www.gov.uk/browse/driving/highway-code-road-safety	

	Bicycles.		
2.2 Discuss the trends in transport and travelspecific to UK.	Transport in UK:- Introduction, Transport Trends, Types of transport, Trends in each transport, Impact.	https://en.wikipedia.org/wiki/Transport_in_the_United_Kingdom http://www.europarl.europa.eu/RegData/etudes/STUD/2018/614540/EPRS_STU(2018)614540_EN.pdf	
2.3 Discuss the funding and financing in transport infrastructure	Funding:- Definition, Types of funding, Financing, Public Private relationship, Comparision on international Investment, graphs and diagrams.	http://www.econ.cam.ac.uk/people-files/emeritus/dmgn/transport/Affuso_newbery_FiscStud.pdf https://transportknowledgehub.org.uk/guidance-tool/funding-financing-transport-infrastructure-services/ http://atrf.info/papers/2008/2008_Hay.pdf	
2.4 Discuss in detail the transport infrastruture and its impact on UK economy.	Transport infrastructure:- Trends, Economic impact, Wider issues, Governance and incentives, Segmented market and Product differentiation, Rail Congestion & investment.	https://iea.org.uk/wp-content/uploads/2016/07/DPaper_Transport%20infrastructure.pdf	

Learning Outcome 3: Understand the process of modeling transport systems.			
Assessment criteria On completion of this unit, the learner can:	Indicative content	Delivery	Assessment
3.1 Discuss the estimation methods for trip generation. 3.2 Explain different types of methods for calculating trip distribution. 3.3 Explain different types of models for calculating mode split. 3.4 Explain in detail about calculating traffic assignment.	Trip Generation:- Meaning, Types, Fundamentals, Variables, Methodology, Improved methods for trip generation, Application. Trip Distribution:- Gravity Model, Intervening Opportunities Model, Choice Model, Entropy Model, Example, Solution. Mode split:- Meaning, Types of models, Application of models, Results, Example and Solution. Traffic Assignment:- Meaning, Types- All-or-nothing, Incremental, Capacity Restaint, User Equilibrium, System Optimum, Relevant data structures, Coupling Models, Examples.	https://ac.els-cdn.com/S1877042814062569/1-s2.0-S1877042814062569-main.pdf?_tid=c8ccafc9-7c01-45e6-8138-5118824b6567&acdnat=1530250223_d22e01324fe75559a603e622f5563272 https://trid.trb.org/view/504387 https://en.wikibooks.org/wiki/Fundamentals_of_Transportation/Trip_Generation http://nptel.ac.in/courses/105104098/34 https://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1986&context=open_access_etds https://halshs.archives-ouvertes.fr/halshs-00092335/document http://nptel.ac.in/courses/105104098/36 https://www.civil.iitb.ac.in/tvm/1100_LnTse/136_lntse/plain/plain.html https://www.toi.no/getfile.php?mmfileid=38655	

List of Learner Resources

Textbooks
• http://www.tiipublications.ie/library/DN-GEO-03060-01.pdf • https://www.newcastle.gov.uk/sites/default/files/wwwfileroot/legacy/regen/plantrans/DesignAndConstructionOfRoadsAndAccessesToAdoptableStandardsMarch2011.pdf • https://trlsoftware.co.uk/library/files/documents/ARCADY_UK%20Empirical%20Methodology.pdf • http://onlinepubs.trb.org/onlinepubs/conferences/2011/RSS/2/Stevanovic,Al.pdf • http://scholar.rhsmith.umd.edu/sites/default/files/mfu/files/hf06.pdf • http://www.europarl.europa.eu/RegData/etudes/STUD/2018/614540/EPRS_STU(2018)614540_EN.pdf • http://www.econ.cam.ac.uk/people-files/emeritus/dmgn/transport/Affuso_newbery_FiscStud.pdf • http://atrf.info/papers/2008/2008_Hay.pdf • https://iea.org.uk/wp-content/uploads/2016/07/DPaper_Transport%20infrastructure.pdf
Journals
Websites
• https://en.wikipedia.org/wiki/United_Kingdom_traffic_laws • https://www.gov.uk/browse/driving/highway-code-road-safety • https://en.wikipedia.org/wiki/Transport_in_the_United_Kingdom • https://transportknowledgehub.org.uk/guidance-tool/funding-financing-transport-infrastructure-services/ • https://ac.els-cdn.com/S1877042814062569/1-s2.0-S1877042814062569-main.pdf?_tid=c8ccafc9-7c01-45e6-8138-5118824b6567&acdnat=1530250223_d22e01324fe75559a603e622f5563272 • https://trid.trb.org/view/504387 • https://en.wikibooks.org/wiki/Fundamentals_of_Transportation/Trip_Generation • http://nptel.ac.in/courses/105104098/34 • https://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1986&context=open_access_etds • https://halshs.archives-ouvertes.fr/halshs-00092335/document • http://nptel.ac.in/courses/105104098/36 • https://www.civil.iitb.ac.in/tvm/1100_LnTse/136_lntse/plain/plain.html • https://www.toi.no/getfile.php?mmfileid=38655

Payment Plan

Please find below available fee payment plans:

6 Months - GBP £1250

● Payment option (a): GBP £416 x 3 monthly instalments
● Payment option (b): GBP £1187.50 x 1 instalment (We offer 5% bursary on total fee for students opting to pay in full)

9 Months - GBP £950

● Payment option (c): GBP £190 x 5 monthly instalments
● Payment option (d): GBP £475 x 2 quarterly instalments
● Payment option (e): GBP £902.50 x 1 instalment (We offer 5% bursary on total fee for students opting to pay in full)

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