

SCHEME OF WORK FOR LEVEL 5 CIVIL ENGINEERING

Lesson 1: Introduction to unit

Suggested Teaching Time: 2 hours



Learning Outcome: Be able to develop a civil-engineering project proposal

Topic	Suggested Teaching	Suggested Resources
Introduction to the unit	<ul style="list-style-type: none">• The tutor should go through the unit specification and explain the need for an understanding of the techniques used to develop an integrated project. The progressive link between the five learning outcomes should be stressed. A short question-and-answer session should be used to check learner understanding of what is to be covered.• The learners should be provided with a glossary of the terms to be used in the unit and encouraged to align each term against specific assessment criteria, as and where relevant. Each term will of course be fully explained later, at the appropriate stage of the teaching and learning process.• The tutor should use the unit specification to explain how the unit is to be assessed. This should deal specifically with the nature of the evidence that will need to be provided.	<ul style="list-style-type: none">• Unit specification• Glossary of terms• Sample assessment materials <p>Websites:</p> <p>www.ice.org (Institution of Civil Engineers)</p> <p>www.cbi.org.uk</p> <p>http://www.tinyurl.com/b2efr77</p>

UNIT 522: INTEGRATED CIVIL ENGINEERING DESIGN PROJECT

Lesson 2: Area for development

Suggested Teaching Time: 8 hours

Learning Outcome: Be able to develop a Civil-engineering project proposal

Topic	Suggested Teaching	Suggested Resources
<p>Investigate an area for development (AC 1.1)</p>	<ul style="list-style-type: none"> The tutor must emphasise that, although robust and timely support will be provided, the decisions made, and the work done, will be the responsibility of the individual learner or group of learners. This is not a taught unit. The tutor and the learner(s) must discuss potential areas for developing projects in order to lead to a mutually agreed project topic. It should be emphasised that the final decision must be drawn from a number of different areas such as the design of a building, a water treatment plant, a sewage treatment plant, a bridge, a dam or something similar. Details of the project topic selected should be entered in the project log book. A wide range of previously completed project documentation should be made available to the learners, in order to assess the scale of the work. There are obvious benefits associated with the selection of a project topic that relates to a real-life, on-going civil-engineering project. If any of the learners are employed, it would be advantageous if they were to develop a project topic in line with the work done by their employers. Where this is the case, the employer should attend the meeting, contribute to the discussion, and approve the decision made. 	<p>Project logbooks: Archived records of previous civil-engineering projects (including drawings and bills of quantities)</p> <p>Websites: http://tinyurl.com/ket64ju (iamcivilengineer) (80 Final Year Project Ideas for Civil-engineering Students) www.ice.org (Institution of Civil Engineers)</p>

Lesson 3: Propose project ideas

Learning Outcome: Be able to develop a civil-engineering project proposal

Topic	Suggested Teaching	Suggested Resources
Propose project ideas (AC 1.2)	<ul style="list-style-type: none"> • This is, as above, a group/individual-learner exercise with the tutor advising students on how to develop a project proposal which should contain the following and more. • It is essential that as much detail as possible concerning the actual project outcomes are discussed at this stage and collectively agreed in writing by all parties. The selected project should also allow scope for knowledge and information from other relevant units being studied concurrently to be incorporated. • The tutor should set time limits for the decision to help the learners structure their project proposal. 	<p>Books:</p> <p>Melton, Trish, <i>Real Project Planning: Developing a Project Development Strategy (Project Management Toolkit)</i>, Butterworth Heinemann (2007) ISBN 0750684720</p> <p>Lock, Dennis, <i>Project Management</i>, 10th Edition, Gower Publishing, 2013, ISBN 1409452690</p> <p>Websites:</p> <p>http://www.sciencedaily.com/news/matter_energy/civil_engineering/</p> <p>Journals:</p> <p><i>New Civil Engineer</i> (http://www.nce.co.uk/)</p> <p><i>Construction News</i></p>

Lesson 4: Scoping the project

Suggested

Learning Outcome: Be able to scope the project

Topic	Suggested Teaching	Suggested Resources
Scoping the project (AC 2.1, 2.2 and 2.3)	<ul style="list-style-type: none"> • This is a group/individual-student type of work where individuals or groups of individuals will start planning for their project covering the following activities. • Project scoping – research and review, feasibility studies, critical analysis of the specification, selection of project options, initiation of a project logbook/diary, estimation of costs and resource implications, identification of goals and agreed roles and responsibilities. • Project specifications – costs, time scales, legislation, ethics, sustainability, quality and resource implications. • Procedures – arrangements for monitoring progress, operating methods, communications, risk analysis and targets. • The project plan – timescales, milestones and quality assurance systems, arrangements for monitoring progress. • Independent student research into archived copies of relevant journals will assist the scoping of the project. 	<p>Books:</p> <p>Melton, Trish, <i>Real Project Planning: Developing a Project Development Strategy (Project Management Toolkit)</i>, Butterworth Heinemann (2007) ISBN 0750684720</p> <p>Lock, Dennis, <i>Project Management</i>, 10th Edition, Gower Publishing, 2013, ISBN 1409452690</p> <p>Journals:</p> <p><i>New Civil Engineer</i> (http://www.nce.co.uk/)</p> <p><i>Construction News</i></p> <p>Websites:</p> <p>http://www.sciencedaily.com/news/matter_energy/civil_engineering/</p> <p>www.ice.org</p>

Lesson 5: Set project objectives

Suggested Teaching Time: 6 hours

Learning Outcome: Be able to set project objectives

Topic	Suggested Teaching	Suggested Resources
Set project objectives (AC 3.1, 3.2 and 3.3)	<ul style="list-style-type: none"> • Learners will now work individually or in groups, with the tutor going round the individuals/groups to monitor their progress. The following activities must now take place in order to set project objectives for the following: <ul style="list-style-type: none"> ○ Increased efficiency ○ Improved customer satisfaction ○ Delivery of effective services ○ Improved quality and output ○ More effective organisation ○ Enhanced competitive edge ○ Opportunities for expansion ○ Increased flexibility ○ Others as specified in the project proposal • The learners must ensure that any health and safety issues that arise from the project are addressed in the project objectives. 	<p>Books: Howard, Keith, Sharp, John, Peters John, <i>The Management of a Student Research Project</i>, 3rd edition, Gower Aldershot, 2002, ISBN 0566084902</p> <p>Websites: www.ice.org (Institution of Civil Engineers)</p>

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Lesson 6: Project design

Suggested Teaching Time: 24 hours



Learning Outcome: Be able to design solutions to meet project objectives

Topic	Suggested Teaching	Suggested Resources
Project design (AC 4.1 and 4.2)	<ul style="list-style-type: none">• This is the major part of the time allocated for the project. This is where the designs must be developed in the manner indicated by the learning outcome.• Learners must use the designs they have created for the selected project topic to demonstrate evaluation of the variables affecting the project, including the calculations and other forms or mathematical reasoning used to support their designs. This should be set in the following monitoring context.• The tutor, learners and, where relevant, employer representatives should meet to discuss and monitor progress at regular intervals. The tutor should encourage learners to create a schedule of agreed meetings and to set agendas to support project planning and realisation. There should be regular assessment of targets against milestones, budget spend and, for group projects, assessment of the performance of individuals.• Minutes of the meetings should be recorded, project logbooks and project files completed and all planning documentation updated.• Project files and/or log books should include the project title, location and nature of the work involved, names of those involved, schedule of dates for completion of project phases, minutes of project meetings, letters, memoranda and other communications; design work and drawings, calculations and costs. It must of course be updated as and when required.	<p>Books: Lawson, Brian, <i>How Designers Think: the Design Process Demystified</i>, 4th edition, Routledge 2005, ISBN 0750660775</p> <p>Websites: www.ice.org (Institution of Civil Engineers)</p>

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Lesson 7: Project presentation

Suggested Teaching Time: 6 hours



Learning Outcome: Be able to present project

Topic	Suggested Teaching	Suggested Resources
Project presentation (AC 5.1, 5.2 and 5.3)	<ul style="list-style-type: none">• Learners should prepare detailed presentations using appropriate media in order to communicate project solutions.• If a group project is used it must be clear what contribution has been made by each individual.• All drawings, tender documentation, bills of quantities, calculations and other records of project development should be displayed.• Records of any meetings and monitoring meetings must be made available.• The presentation must be made to an audience of fellow students, tutors and, if possible, employers and other representatives of the civil-engineering sector.• Those presenting should demonstrate evidence of having planned and practiced the presentation, and should present clearly and concisely, with awareness of the audience and an ability to deal with feedback and questions.• Tutors, and any employers, should complete objective witness testimonies or observation statements.	<p>Books: Levin, Peter, Topping, Graham, <i>Perfect Presentations</i>, Oxford University Press, 2006, ISBN: 0335219055</p> <p>Presentational equipment: OHP + transparencies, software presentational packages, computer, digital projector, charts, models, video/CD, flip chart, white board.</p>