SCQF level 7
Unit Specification

Engineering Project Management

SCQF: level 7 (8 SCQF credit points)

Unit code: J2BX 77

Unit outline

The general aim of this Unit is to develop knowledge and skills of project management as it applies to an engineering project. Learners will investigate an industrial engineering project, and consider its environmental, social and ethical impact. Learners will select an appropriately challenging engineering problem, carry out research in relation to the problem, and develop a proposal for a solution to the problem. The proposed solution may be carried forward, implemented and evaluated within the Course assessment project.

Learners who complete this Unit will be able to:

1 Investigate a real-world engineering project
2 Develop a design proposal and plan to solve a challenging engineering problem

This is also available as a free-standing Unit. The Unit Specification should be read in conjunction with the *Unit Support Notes*, which provide advice and guidance on delivery, assessment approaches and development of skills for learning, skills for life and skills for work. Exemplification of the standards in this Unit is given in *Unit Assessment Support*.

Recommended entry

Entry to this Unit is at the discretion of the centre. However, learners would normally be expected to have attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and/or experience:

- Engineering Contexts and Challenges (SCQF level 6) Unit
- Higher Engineering Science Course

Equality and inclusion

This Unit Specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence. For further information, please refer to the *Unit Support Notes.*

Standards

Outcomes and assessment standards

Outcome 1

The learner will:

1 Investigate a real-world engineering project by:

1.1 Selecting a contemporary, innovative, real-world engineering project
1.2 Reporting on how the project has developed and is managed
1.3 Reporting on any environmental, social and ethical impacts of the project

Outcome 2

The learner will:

2 Develop a design proposal and plan to solve a challenging engineering problem by:

2.1 Selecting a suitably challenging engineering problem
2.2 Producing an outline design proposal to solve the problem
2.3 Producing an outline project plan for implementing the proposal

Evidence requirements for the Unit

Assessors should use their professional judgement, subject knowledge and experience, and understanding of their learners, to determine the most appropriate ways to generate evidence and the conditions and contexts in which they are used.

Evidence of Outcome 1 should be a report on a chosen real-world engineering project.

Evidence of Outcome 2 should be a project plan and a design proposal in an appropriate format.

Exemplification of assessment is provided in *Unit Assessment Support*. Advice and guidance on possible approaches to assessment is provided in the *Unit Support Notes.*

Assessment standard thresholds

If a candidate successfully meets the requirements of the specified number of Assessment Standards they will be judged to have passed the Unit overall and no further re-assessment will be required.

The specific requirements for this Unit is as follows:

- 4 out of 6 Assessment Standards must be achieved.

It should be noted that there will still be the requirement for candidates to be given the opportunity to meet all Assessment Standards. The above threshold has been put in place to reduce the volume of re-assessment where that is required.

Development of skills for learning, skills for life and skills for work

It is expected that learners will develop broad, generic skills through this Unit. The skills that learners will be expected to improve on and develop through the Unit are based on SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work* and drawn from the main skills areas listed below. These must be built into the Unit where there are appropriate opportunities.

2 Numeracy

2.1 Number processes
2.3 Information handling

3 Health and wellbeing

3.1 Personal learning

4 Employability, enterprise and citizenship

4.2 Information and communication technology (ICT)

5 Thinking skills

5.3 Applying
5.4 Analysing and evaluating

Amplification of these is given in SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work.* The level of these skills should be at the same SCQF level as the Unit and be consistent with the SCQF level descriptor. Further information on building in skills for learning, skills for life and skills for work is given in the *Unit Support Notes.*

Appendix: unit support notes

These support notes provide advice and guidance on approaches to delivering and assessing this unit. They are intended for teachers and lecturers who are delivering this unit. They should be read in conjunction with:

- the *unit specification*
- the *unit assessment support packs (UASP)*

The systems approach	Use of system, sub-system and control diagrams to analyse complex engineering systems, including time- and event-based systems
Energy and efficiency	Use of energy audits and cost implications to inform engineering decisions ♦ Applied calculations involving efficiency, work done and power, in complex situations, using: $E_w = Fd$ $P = E/t$, $E_k = \frac{1}{2} mv^2$ $E_p = mgh$ $E_e = VIt$ $E_h = cm\Delta T$ Efficiency $\eta = E_{out}/E_{in} = P_{out}/P_{in}$
Calculations	extracting data for use in analysis and calculations manipulating and combining given formulae to obtain answers solving simultaneous equations solving quadratic equations applying trigonometric techniques using integration and differentiation in familiar contexts
Engineering roles and disciplines	Research and development Resource management Time management (including critical path analysis and Gantt charts) Cost allocation management (capital costs, direct costs, indirect costs, oncosts) Product life cycle planning
Impacts of engineering	Social and economic impacts of engineering Sustainability and environmental impacts of engineering

Administrative information

Published: July 2019 (version 3.0)

Superclass: XA

History of changes to National Unit Specification

Version	Description of change	Authorised by	Date
2.0	Minor changes to wording of Assessment Standards 2.2 and 2.3 and evidence requirements for Outcome 2.	Qualifications Development Manager	April 2015
2.1	Assessment standard thresholds added	Qualifications Manager	September 2018
2.2	Unit support notes added		
3.0	Unit code updated	Qualifications Manager	July 2019