



Arrangements for:
**SQA Advanced Certificate in Petroleum
Engineering**

Group Award Code: GM9H 47

**SQA Advanced Diploma in Petroleum
Engineering**

Group Award Code: GN11 48

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1 Introduction

This is the Arrangements Document for the Group Award(s) in SQA Advanced Certificate in SQA Advanced Certificate in Petroleum Engineering and SQA Advanced Diploma in Petroleum Engineering. This document includes background information on the group award, its aims, details of the group award structure, and guidance on delivery.

2 Rationale for the Group Awards

The SQA Advanced Certificate and SQA Advanced Diploma in Petroleum Engineering Group Awards are designed to equip candidates with the knowledge, understanding and skills required for success in current and future employment or for progression to further academic and/or professional qualifications.

3 Aims of the Group Awards

3.1 General aims of the SQA Advanced Certificate in Petroleum Engineering

- 1 To develop candidate knowledge and skills in planning, analysis and evaluation within petroleum engineering.
- 2 To develop employment skills related to the petroleum engineering industries.
- 3 To enable progression within the SCQF.
- 4 To develop study and research skills within the petroleum engineering environment.
- 5 To facilitate access to Higher Education Institutions (HEIs).
- 6 To develop transferable skills, including Core Skills, to levels demanded by employers and for progression to further and/or higher education.
- 7 To develop effective team working skills.
- 8 To develop a range of contemporary vocational skills relating to the use, support and development of systems appropriate to employment at technician or professional level.

3.2 Specific aims of the SQA Advanced Certificate in Petroleum Engineering

- 9 To prepare candidates for an appropriate level of employment in petroleum engineering.
- 10 To develop an understanding of exploration and production operations involved in hydrocarbon resource exploitation.
- 11 To develop an understanding of drilling engineering, petroleum production technologies and design requirements.
- 12 To develop a basic understanding of petroleum geology and reservoir engineering.
- 13 To develop an understanding of the key issues within petroleum engineering.
- 14 To introduce the physical and chemical principles utilised within petroleum engineering.

3.3 General aims of the SQA Advanced Diploma in Petroleum Engineering

(in addition to aims 1–8 above)

- 15 To further develop transferable skills to levels demanded by employers, and for progression to higher education.
- 16 To enhance employability by developing skills and competencies relevant to the petroleum industry.
- 17 To develop cultural empathy, flexibility and change assimilation skills.

3.4 Specific aims of the SQA Advanced Diploma in Petroleum Engineering

(in addition to aims 9–14 above)

- 18 To develop skills and knowledge in petroleum production systems and data logging.
- 19 To develop an understanding of downhole and topside production techniques and operations.
- 20 To advance existing understanding of drilling techniques, equipment, operations and equipment used to prepare a well for completion.
- 21 To develop an understanding of techniques and equipment used to complete a well for production operations.
- 22 To further develop Core Skills in Communication, Numeracy and Information Technology.
- 23 To develop skills in mathematics.
- 24 To develop competences in line with the regulations and conditions of the UK industry training organisation (OPITO) and the internationally recognised professional institute – the Society of Petroleum Engineers (SPE).
- 25 To develop awareness of stakeholder and societal involvement in environmental issues related to the petroleum industry.

3.5 Target groups

The awards are suitable for a wide range of candidates including:

- ◆ School leavers wishing to pursue a career within the petroleum industry
- ◆ Existing employees wishing to gain or extend their qualifications
- ◆ Employees undertaking vocational qualifications (VQs) wishing to acquire relevant and appropriate underpinning knowledge
- ◆ Candidates wishing to move on to higher education in an appropriate discipline area

3.6 Employment opportunities

These awards are designed to provide candidates with the knowledge and skills required for a range of roles within the petroleum engineering environment.

Candidates successfully achieving the SQA Advanced Certificate award may gain employment as:

- ◆ trainee production engineer assistants
- ◆ trainee process engineer operators in production area

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Candidates successfully achieving the SQA Advanced Diploma award may gain employment as:

- ◆ (oil)well engineering services technicians
- ◆ process engineering technicians in production area

4 Access to Group Awards

Access to the SQA Advanced Certificate in Petroleum Engineering and the SQA Advanced Diploma in Petroleum Engineering awards is at the discretion of the centre. All prospective candidates should be treated fairly in regard to access and centres should ensure that there are no unnecessary barriers to entry.

It is the responsibility of centres to ensure that candidates have the formal qualifications and/or work experience and enthusiasm for the vocational area that would give them a reasonable chance of successfully achieving the awards.

Examples of appropriate entry requirements are given below - this is intended to provide guidance to centres. They are not exhaustive or mutually exclusive and may be considered in a variety of combinations.

4.1 Qualifications

Candidates desiring entry to the SQA Advanced Certificate in Petroleum Engineering, or to the first year of the SQA Advanced Diploma in Petroleum Engineering, should have:

- ◆ One National Course at SCQF level 6 in a relevant subject preferably Mathematics or Physics or Chemistry plus four Standard Grades at Credit Level or National Courses at Intermediate 2 at grade 'C' or above
or
- ◆ A programme of National Units in a suitable subject area eg Engineering or Science at SCQF level 5 and 6
or
- ◆ Awards from other awarding bodies, provided that the competencies can be identified and matched to the above, including SVQ/NVQs in an appropriate occupational area.

In addition, any appropriate combination of the above qualifications may be acceptable.

4.2 English as an additional language

For candidates where English is not the first language, it is recommended that candidates possess English for Speakers of Other Languages (ESOL) at SCQF level 5.

4.3 Entry to Year 2 SQA Advanced Diploma

In order to achieve the SQA Advanced Diploma in Petroleum Engineering candidates must gain 30 SQA Credits. Ideally full-time candidates should be encouraged to achieve 15 credits in each year of the award. Wider access should be provided to cater for the needs of those, for example, who have achieved the SQA

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Advanced Certificate at day release or evening classes or in other colleges. Candidates would therefore be expected to have a minimum of 12 credits on entry to Year 2 and these would include the SQA Advanced Certificate in Petroleum Engineering mandatory Units.

In addition, those candidates wishing to progress to the second year of the SQA Advanced Diploma and who are not in possession of Mathematics at SCQF level 6 on entry to the first year should be advised to undertake one of the Mathematics options from Group B, to prepare them for the SQA Advanced Diploma Mandatory Unit, *Engineering Mathematics 2* (HP49 47).

4.4 Work experience

Candidates who do not possess the formal entry qualifications suggested above, in Section 4.1, may be considered for entry, if they have relevant, appropriate work experience in petroleum engineering or its related industries.

Work experience used as evidence for entry should be current, and candidates may be asked to provide evidence.

4.5 Recommended Core Skills Entry profile

The recommended Core Skills entry profiles for the awards are given in the table below:

Core Skill	SQA Advanced Certificate	SQA Advanced Diploma
	SCQF level	SCQF level
Communication	5	6
Numeracy	5	6
Information Technology	5	6
Problem Solving	5	6
Working with Others	5	6

If candidates with appropriate qualifications and/or work experience apply and are unable to satisfy the above Core Skills entry profile then it is recommended that centres apply Core Skills diagnostics and agree an appropriate support package.

4.6 Pre-entry interview

Applicants may be invited to attend a pre-entry interview where their suitability for the course of study will be explored. The interview will give applicants the opportunity of ensuring that the course of study will assist them to meet their career aspirations.

A personal learning plan may evolve from such discussions which will identify a route map through the qualifications framework for each candidate including any Core Skills support identified. Any departure from the recommended access requirements stated above would be documented within this personal learning plan.

5 Group Awards structure

The awards have been designed in accordance with SQA’s design principles for SQA Advanced Awards, ie:

- ◆ SQA Advanced Certificates shall be designed to be at SCQF level 7 and shall comprise 96 SCQF credit points with at least 48 credit points at SCQF level 7. The SQA Advanced Certificate should include a mandatory section of at least 48 SCQF credit points and include one Graded Unit of 8 SCQF credit points at SCQF level 7.
- ◆ SQA Advanced Diplomas shall be designed to be at SCQF level 8 and shall comprise 240 SCQF credits points with at least 64 credit points at SCQF level 8. The SQA Advanced Diploma should include a mandatory section of at least 96 SCQF credit points and include one Graded Unit of 8 SCQF credit points at SCQF level 7, plus 16 SCQF credit points of Graded Unit(s) at SCQF level 8.
- ◆ The SQA Advanced Certificate and SQA Advanced Diploma programmes shall incorporate opportunities for candidates to develop Core Skills to levels required by the occupations or progression pathways that the SQA Advanced supports.

5.1 Frameworks

SQA Advanced Certificate in Petroleum Engineering

To attain the Group Award of the SQA Advanced Certificate in Petroleum Engineering candidates must achieve 12 SQA Credits — all mandatory Units in *Group A* totalling 7 SQA Credits, and optional Units totalling 5 SQA Credits consisting of either 1 SQA Credit from *Group B* plus 4 SQA Credits from *Group C*, or 5 SQA Credits from *Group C*.

Mandatory Units Group A — 7 SQA Credits (56 SCQF credit points) required

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Science Industry: Key Issues	HV4J 47	8	7	1
Petroleum Engineering: Physics, Mathematics and Chemistry	HV4P 47	8	7	1
Petroleum Geology and Geophysics: An Introduction	HV4R 47	8	7	1
Petroleum Reservoir Engineering: An Introduction	HV4T 47	8	7	1
Oilfield Drilling Techniques and Operations: An Introduction	HV4N 47	8	7	1
Communication: Practical Skills	HP4A 47	8	7	1
Petroleum Engineering: Graded Unit 1	HV4G 47	8	7	1

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Optional Units Group B — up to 1 SQA Credit (8 SCQF credit points) required

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Mathematics for Science 1	HV6N 46	8	6	1
Engineering Mathematics 1	HP48 46	8	6	1

Optional Units Group C — from 4 to 5 SQA Credits (32/40 SCQF credit points) required

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Information Technology: Applications Software 1	HP6L 47	8	7	1
Engineering Mathematics 2	HP49 47	8	7	1
Fundamental Chemistry: An Introduction Or Fundamental Chemistry: An Introduction	HV49 46 HV0G 46	8 8	6 6	1 1
Fundamental Chemistry: Theory and Practice	HV4H 47	16	7	2
Engineering Science Principles	HV4K 47	8	7	1
Process Safety Engineering	HV0C 47	8	7	1
Electrical Systems in Potentially Explosive and Gas Hazardous Environments	HV3K 47	8	7	1
Environmental Awareness	HV4M 47	8	7	1
Pneumatics and Hydraulics	HT7F 47	8	7	1
Fire and Gas Detection	HV4L 47	8	7	1
Heat Transfer and Fluid Mechanics	HT7R 48	8	8	1
Oil Well Management	HV5T 48	8	8	1
Petroleum Production Processes	HV5V 48	8	8	1
Engineering Measurement and System Monitoring	HV43 47	8	7	1
Materials Selection	HT76 47	8	7	1
Principles of Safe Engineering Systems	HV5G 48	8	8	1
Computer Aided Draughting for Engineers	HT73 47	8	7	1
Engineering Drawing	HT72 47	8	7	1
Engineering Systems Analysis: System Modelling and Control	HV5E 48	8	8	1
Application of Programmable Logic Controllers	HT1K 47	8	7	1
Quality Management: An Introduction	HT7A 47	8	7	1
Safety Engineering and the Environment	HT7P 47	8	7	1
Fundamentals of Control Systems and Transducers	HT1R 47	8	7	1
Engineering Communication	HV42 47	8	7	1
Mechanical Engineering Principles	HV2V 47	8	7	1
Electricity Power Systems	HV3L 47	8	7	1

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SQA Advanced Diploma in Petroleum Engineering

To attain the award of SQA Advanced Diploma in Petroleum Engineering candidates must achieve 30 SQA Credits — all mandatory Units from *Group A* totalling 16 SQA Credits, and optional Units totalling 14 SQA Credits from *Groups B, C and D*.

Mandatory Units Group A – 16 SQA Credits (128 SCQF credit points) required

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Communication: Practical Skills	HP4A 47	8	7	1
Project Management: Managing the Implementation of a Project	HR0T 48	16	8	2
Science Industry: Key Issues	HV4J 47	8	7	1
Engineering Mathematics 2	HP49 47	8	7	1
Petroleum Engineering: Physics, Mathematics and Chemistry	HV4P 47	8	7	1
Petroleum Geology and Geophysics: An Introduction	HV4R 47	8	7	1
Petroleum Reservoir Engineering: An Introduction	HV4T 47	8	7	1
Oilfield Drilling Techniques and Operations: An Introduction	HV4N 47	8	7	1
Oilfield Drilling Techniques and Operations	HV9H 48	8	8	1
Oil Well Management	HV5T 48	8	8	1
Petroleum Recovery Techniques	HV9J 48	8	8	1
Petroleum Production Processes	HV5V 48	8	8	1
Petroleum Engineering: Graded Unit 1	HV4G 47	8	7	1
Petroleum Engineering: Graded Unit 2	HV9K 48	16	8	2

Optional Units Group B — up to 1 SQA Credit (8 SCQF credit points) required

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Mathematics for Science 1	HV6N 46	8	6	1
Engineering Mathematics 1	HP48 46	8	6	1

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Optional Units Group C — from 11 to 14 SQA Credits (88/96/104/112 SCQF credit points) required

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Fundamental Chemistry: An Introduction Or Fundamental Chemistry: An Introduction	HV49 46 HV0G 46	8 8	6 6	1 1
Information Technology: Applications Software 1	HP6L 47	8	7	1
Fundamental Chemistry: Theory and Practice	HV4H 47	16	7	2
Engineering Science Principles	HV4K 47	8	7	1
Process Safety Engineering	HV0C 47	8	7	1
Electrical Systems in Potentially Explosive and Gas Hazardous Environments	HV3K 47	8	7	1
Quality and Health and Safety Systems in Science Industries	HV0H 47	8	7	1
Environmental Awareness	HV4M 47	8	7	1
Pneumatics and Hydraulics	HT7F 47	8	7	1
Fundamental Concepts of Organic Chemistry Or Organic Chemistry: Theory and laboratory Skills	HV97 47 HV0L 47	8 8	7 7	1 1
Fundamental Concepts of Inorganic Chemistry	HV96 47	8	7	1
DC and AC Principles	H946 47	8	7	1
Three Phase Systems	HT7K 47	8	7	1
Process Operations: Distillation	HV9G 48	8	8	1
Fundamental Concepts of Physical Chemistry	HV98 47	8	7	1
Thermofluids	HT7C 47	8	7	1
Instrumentation in Hazardous Areas	HV65 47	8	7	1
Fire and Gas Detection	HV4L 47	8	7	1
Process Control	HT9X 47	8	7	1
Dynamics	HT7E 47	8	7	1
Working within a Project Team	HT3P 47	8	7	1
Electrochemistry	HV9C 48	8	8	1
Thermodynamics and Kinetics	HV99 48	8	8	1
Aromatic Chemistry	HV9A 48	8	8	1
Base-Catalysed Reactions and Organometallic Reagents in Organic Synthesis	HV9D 48	8	8	1
Phase Equilibrium and Surface Chemistry	HV9E 48	8	8	1
Organic Stereochemistry	HV9F 48	8	8	1
Heat Transfer and Fluid Mechanics	HT7R 48	8	8	1
Process Control by Computer	HV60 48	8	8	1
Three Phase Induction Motors	HV3G 48	8	8	1
Electrical Motor Drive Systems	HT7M 48	8	8	1
Mathematics for Engineering 3	HT1E 48	8	8	1
Engineering Measurement and System Monitoring	HV43 47	8	7	1
Materials Selection	HT76 47	8	7	1
Principles of Safe Engineering Systems	HV5G 48	8	8	1

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Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Computer Aided Draughting for Engineers	HT73 47	8	7	1
Engineering Drawing	HT72 47	8	7	1
Engineering Systems Analysis: System Modelling and Control	HV5E 48	8	8	1
Application of Programmable Logic Controllers	HT1K 47	8	7	1
Quality Management: An Introduction	HT7A 47	8	7	1
Safety Engineering and the Environment	HT7P 47	8	7	1
Fundamentals of Control Systems and Transducers	HT1R 47	8	7	1
Engineering Communication	HV42 47	8	7	1
Mechanical Engineering Principles	HV2V 47	8	7	1
Electricity Power Systems	HV3L 47	8	7	1
Engineering Mathematics 3	HT1M 47	8	7	1
Engineering Mathematics 4	HT03 48	8	8	1
Engineering Mathematics 5	HT1N 48	8	8	1

Optional Units Group D — up to 2 SQA Credits (16 SCQF credit points) required

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Workplace Communication in English	HR1C 46	8	6	1
Personal Development Planning	HP6M 47	8	7	1
Work Placement	HP4X 47	8	7	1
Business Awareness and Continuing Professional Development	HP3H 48	8	8	1

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5.1.1 Graded Units

The purpose of the Graded Units is to assess the candidates' ability to integrate and apply the knowledge and skills gained in individual SQA Advanced Units; to demonstrate that they have achieved the principal aims of the Group Awards; and to grade candidate achievement. As these Group Awards are, in the main, designed to provide candidates with the knowledge and skills required for entry into employment, it was agreed that Project based Graded Units were appropriate.

In the SQA Advanced Certificate in Petroleum Engineering candidates will undertake one Graded Unit of 8 SCQF credit points at SCQF level 7. This Project based Graded Unit will take the form of a case study.

Candidates progressing to Year 2 of SQA Advanced Diploma in Petroleum Engineering will also undertake a further Graded Unit of 16 SCQF credit points at SCQF level 8. This Project based Graded Unit taking the form of a practical assignment.

5.1.2 Recommended Core Skills Entry and Exit levels

The importance of Core Skills has been recognised and these are developed throughout the awards.

Core Skills	SQA Advanced Certificate	SQA Advanced Certificate	SQA Advanced Diploma
	Entry level	Exit level	Exit level
Communication	SCQF 5	SCQF 6	SCQF 6
Numeracy	SCQF 5	SCQF 6	SCQF 6
IT	SCQF 5	SCQF 6	SCQF 6
Problem Solving	SCQF 5	SCQF 6	SCQF 6
Working with Others	SCQF 5	SCQF 6	SCQF 6

Appendix 2 contains a Core Skill Signposting table which shows where each of the Core Skills may be developed or is embedded within specific Units.

5.2 Mapping information

An indication of how the Units map to the aims of the awards, as outlined in Section 3, is given Appendix 1.

5.2.1 Links to National Occupation Standards (NOS)

The SQA Advanced links with several SVQs offered in with the Oil and Gas occupational area. Further details are given in Appendix 4. It is recognised that successful SQA Advanced Certificate/Diploma candidates will have demonstrated much of the underpinning knowledge in the NOS in many of these SVQs. Appendix 4 shows where specific SQA Advanced Certificate/Diploma Units map to the underpinning knowledge for the NOS related to the SVQ in Processing Operations: Hydrocarbons at level 3.

5.3 Articulation and professional recognition

5.3.1 Articulation

Although there are no formal articulation arrangements in place it may be possible for successful candidates to progress to the following degree courses:

- ◆ Geoservices
- ◆ Petroleum Engineering
- ◆ Chemical Engineering
- ◆ Chemical Engineering: Oil and Gas

HEIs offering relevant degrees include:

- ◆ The University of Aberdeen
- ◆ Heriot Watt University
- ◆ University of Rennes

Candidates are advised to liaise directly with the HE establishments prior to each year's intake of candidates as Unit credits that count towards entry requirements can vary and applications will be considered on an individual basis.

5.3.2 Professional recognition

There are no formal professional bodies which recognise these awards at present.

5.3.3 Higher Education

Articulation arrangements exist between a number of Scottish, UK and international universities where SQA Advanced Certificates and Diplomas will be accepted as advanced entry to either the second or third year of a related degree programme. Depending on the specific degree programme, certain units may be required as part of the SQA Advanced Certificate/Diploma. The optional section of the framework is sufficiently broad to ensure that centres are able to comply with reasonable articulation requests. A high proportion of our candidates have articulated to degree programmes and successfully completed them.

5.3.4 Professional Bodies

SQA Advanced Certificates and Diplomas are recognised by many professional bodies. Candidates achieving an SQA Advanced Certificate/Diploma may meet the professional body entry requirements. Candidates may also gain partial and full exemptions to professional body exams.

6 Approaches to delivery and assessment

Content and context

The SQA Advanced Certificate/SQA Advanced Diploma in Petroleum Engineering are specialised awards which allow candidates to gain advanced knowledge and technical skills in health and safety, exploration, oil well drilling, well completion and the production process involved in oil and gas production.

It is recommended that delivery centres embed a culture which leads to a raised awareness of the industrial environment within which candidates are likely to operate, and the hazards that might ensue from actions taken in operational activities and situations. It is envisaged that the culture will also develop the ‘softer’ skills demanded by potential employers. This may include continuous quality improvement through evaluation and minimising risk.

It is recommended that candidates be encouraged to:

- ◆ observe, analyse and take action within their surroundings
- ◆ take appropriate technical and professional actions avoiding and/or minimising risk; and
- ◆ permeate such an ethos across all areas of the Group Awards

It is recognised that gaining real work experience while studying will be difficult, due to the workplace environmental constraints, particularly for full-time candidates. It is therefore recommended that delivering centres utilise where possible:

- ◆ Simulated environments
- ◆ Visits to operational sites and visits to training sites
- ◆ Attendance at SPE chapter meetings
- ◆ Guest speakers from industry to address candidates

Centres should seek to utilise up-to-date technology such as web cams and video conferencing to demonstrate real life situations to candidates.

By choosing an appropriate range of options candidates can prepare for employment in oil exploration and extraction. Alternatively candidates can choose to proceed to degree level courses at a number of universities.

It is envisaged that the SQA Advanced Certificate award will be the preferred option for those in employment and could be an appropriate course to form part of a Modern Apprenticeship for oil and gas production workers. While some workers in employment may choose to progress to the SQA Advanced Diploma, it is more likely that the SQA Advanced Diploma will be undertaken by full-time candidates. While progression to degree level courses is one option open to candidates, it should be remembered that the SQA Advanced Diploma is a vocational qualification and it is therefore important that there is an emphasis on the skills required to work in the industry. All the Units should be delivered with a strong emphasis on current industry practice.

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6.1 Delivery sequence

It is recommended that full-time SQA Advanced Diploma candidates study the Units comprising the SQA Advanced Certificate award in Year 1, plus an additional 3 SQA Credits, prior to progressing to the second year of the award. The sequencing of Units is at the discretion of delivering centres. Appendix 3 gives suggested delivery schedules for a 2-semester and a 3-block academic session. Centres should take account of the recommended entry requirements for each Unit when considering their delivery schedules. For instance candidates would require an understanding of drilling techniques before they could complete the Units in *Oil Well Management* (HV5T 48) or *Petroleum Production Processes* (HV5V 48).

It is envisaged that many candidates will be part-time students, some of whom will be distance learners. This will require flexibility in the ways in which candidates can undertake the Units. Sequencing may well depend on the delivery mode, with Units that require supervised assessments being scheduled to allow the assessment to coincide with times that the candidates can attend the centre.

6.2 Delivery of the Graded Units

Given the integrated nature of the Graded Units, it is anticipated that the entire course team will be involved in the delivery of the contributing Units. Both Graded Unit 1 and Graded Unit 2 involve the candidates carrying out individual projects. The delivery involves advice and support to the candidates as they complete their work. Centres may find this easier if the supervision is shared across the course team to ensure candidates have access to a range of curricular experts.

Timing of the assessment is important. For full-time candidates it is recommended that the Graded Units are scheduled to run during the middle part of the academic year, possibly November to April. The rationale for this is that:

- ◆ candidates are not completing major pieces of work at the same time as they are preparing for end of Unit assessments
- ◆ centres have time to mark and grade the projects before sending them for central verification if required
- ◆ if visiting verification takes place, candidates will have some evidence for verification

The majority of candidates regard the Graded Units as highly significant and may spend a disproportionate amount of time on them. It is important for centres to offer good advice and not allow candidates to neglect the work of other Units in pursuit of an 'A' grade for the Graded Units.

6.3 Delivery modes

It is envisaged that the SQA Advanced Certificate and the SQA Advanced Diploma will be delivered as both full-time and part-time courses. It is expected that for those candidates in employment delivery will be available via a variety of distance learning modes.

Full details on the suitability of individual Units for Open Learning are contained in each individual Unit specification. It is recognised that aspects of many Units could be delivered on an Open Learning basis, however, assessment conditions must be adhered to for all delivery modes.

6.4 Assessment strategy

The SQA Advanced Design Principles, which encourage a more holistic approach to assessment, have been adopted in both awards. The new SQA Advanced Unit specification places the emphasis on reducing the assessment load for candidates and centres by devising assessments which assess the entire content of the Unit where appropriate, and by sampling of knowledge and/or skills.

A range of assessment strategies have been suggested, with some Units being assessed by end of Unit assessments, carried out under closed-book, supervised conditions, while others require the completion of case studies or other assignments that candidates can complete in their own time.

Having end of Unit assessments means that the majority of assessments need to take place towards the end of the teaching blocks. This represents a change from the current system, where assessments could be spread over a longer period of time. Centres should carefully plan the course to offer candidates every opportunity to succeed. If it is possible, introducing staggered starts for some Units may help with reducing the loading on candidates. Also it may help to plan the delivery to ensure that Units which do not require a closed-book assessment, run in conjunction with those that do, hence reducing the possibility that candidates will be faced with a large number of end of Unit assessments over a short period of time.

Unit specifications detail exactly the Evidence Requirements and assessment conditions for each assessment event. Should centres wish to use a different mode of assessment from that recommended, they should seek prior verification from SQA.

Assessment exemplar materials for a number of Units in these awards is available from SQA. All assessments must be conducted in line with the SQA '*Guide to Assessment*'. This in itself will pose issues for distance learners who may well be working at their own pace. The guidelines now make 'assessment on demand' more difficult for centres to manage. Also the requirement to have end of Unit assessments under closed-book supervised conditions could be restrictive for distance learners. The presenting centre will have to ensure that candidates can sit such assessments in an appropriate environment and that security of the assessments is maintained. To maintain the validity of assessments it is expected that all candidates would sit an assessment at the same time. This again could be an issue for distance learners and centres may require to have a bank of assessments for each Unit if they wish to allow candidates to sit assessments at different times in the year.

6.5 Integration opportunities

Assessment for all Units within both SQA Advanced Certificate and SQA Advanced Diploma in Petroleum Engineering will attempt to address the practical aspects of the Units, and assessments will reflect a “hands on” approach wherever possible. The overall strategy for assessment is that wherever possible, and where permissible, assessments will be integrated across Outcomes within Units, to reduce the overall amount of assessment load placed on candidates.

If possible and practical, consideration will be given to assessing across Units wherever this is feasible. This would add credibility to the claim that assessment was based on “real work” scenarios, and not dealt with in a compartmentalised manner.

6.6 Re-assessment

Guidelines for re-assessment should be included in course documentation such as course handbooks and instruments of assessment. Candidates should be allowed re-assessment opportunities in line with centre policy. Guidance should be provided by delivery staff and course team members.

7 General information for centres

Equality and inclusion

The unit specifications making up this group award have been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners will be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

Internal and external verification

All instruments of assessment used within this/these Group Award(s) should be internally verified, using the appropriate policy within the centre and the guidelines set by SQA.

External verification will be carried out by SQA to ensure that internal assessment is within the national guidelines for these qualifications.

Further information on internal and external verification can be found in *SQA's Guide to Assessment and Quality Assurance for Colleges of Further Education* (www.sqa.org.uk).

8 General information for candidates

The SQA Advanced Certificate and SQA Advanced Diploma in Petroleum Engineering awards have been designed to provide you with a broad-based, multi-disciplinary, petroleum exploration, production and environmental qualification which will allow you to articulate to higher education and to promote career enhancement.

You will develop a variety of knowledge and skills including:

- ◆ Physical and chemical aspects of petroleum engineering
- ◆ An introduction to petroleum geology and geophysics
- ◆ Petroleum reservoir engineering
- ◆ Oilfield drilling operations
- ◆ Petroleum recovery techniques and production processes

You may also choose options which will develop your skills in mathematics, information technology, communication and several complementary strands of engineering.

To achieve the SQA Advanced Certificate in Petroleum Engineering you must achieve 12 SQA Credits — 7 mandatory credits and 5 optional credits. The SQA Advanced Diploma in Petroleum Engineering consists of 30 SQA Credits — 16 mandatory credits and 14 optional credits.

The content of the awards is delivered via SQA Advanced Units (which may have a one or two SQA Credit value) and you may be assessed in a variety of ways. Some Units have end of Unit assessments while others ask you to complete exercises based on case studies and research specific items of interest. All assessment instruments will be directly related to the activities you might anticipate being involved in while working within the petroleum industry.

Both the SQA Advanced Certificate and SQA Advanced Diploma Group Awards contain Graded Units which integrate the knowledge and skills of the mandatory Units within the Group Awards. Graded Unit 1 (SQA Advanced Certificate) is based round a case study and you will be asked to produce a report on the activities involved within the case study. Graded Unit 2 (SQA Advanced Diploma) will be a project, involving research into a particular topic.

You will also have an opportunity to develop the Core Skills of *Communication, Numeracy, Problem Solving, IT* and *Working with Others* within the awards

These awards provide the underpinning knowledge for a number of SVQs that are offered in the industry and you may undertake a SVQ with your employer. You may gain employment as a Production Process Operator, although other career opportunities such as Reservoir Engineering, Drilling Operators, etc. may arise.

9 Glossary of terms

SCQF: This stands for the Scottish Credit and Qualification Framework, which is a way of speaking about qualifications and how they inter-relate. We use SCQF terminology throughout this guide to refer to credits and levels. For further information on the SCQF visit the SCQF website at www.scqf.org.uk

SCQF credit points: One SQA Credit is equivalent to 8 SCQF credit points. This applies to all SQA Advanced Units, irrespective of their level.

SCQF levels: The SCQF covers 12 levels of learning. SQA Advanced Units will normally be at levels 6–9. Graded Units will be at level 7 and 8.

Subject Unit: Subject Units contain vocational/subject content and are designed to test a specific set of knowledge and skills.

Graded Unit: Graded Units assess candidates' ability to integrate what they have learned while working towards the Units of the Group Award. Their purpose is to add value to the Group Award, making it more than the sum of its parts, and to encourage candidates to retain and adapt their skills and knowledge.

Dedicated Unit to cover Core Skills: This is a non-subject Unit that is written to cover one or more particular Core Skills.

Embedded Core Skills: This is where the development of a Core Skill is incorporated into the Unit and where the Unit assessment also covers the requirements of Core Skill assessment at a particular level.

Signposted Core Skills: This refers to the opportunities to develop a particular Core Skill at a specified level that lies outside automatic certification.

Qualification Design Team: The QDT works in conjunction with a Qualification Manager/Development Manager to steer the development of the SQA Advanced Certificate/Diploma from its inception/revision through to validation. The group is made up of key stakeholders representing the interests of centres, employers, universities and other relevant organisations.

Consortium-devised SQA Advanced Certificates and SQA Advanced Diplomas are those developments or revisions undertaken by a group of centres in partnership with SQA.

Specialist single centre and specialist collaborative devised SQA Advanced Certificates and SQA Advanced Diplomas are those developments or revisions led by a single centre or small group of centres who provide knowledge and skills in a specialist area. Like consortium-devised SQA Advanced Certificates and SQA Advanced Diplomas, these developments or revisions will also be supported by SQA.

10 Appendices

- Appendix 1: Mapping of aims to mandatory Units
- Appendix 2: Core Skills mapping of a Group Award
- Appendix 3: Suggested delivery schedule
- Appendix 4: Links to National Occupational Standards
- Appendix 4A: Mapping of National Occupational Standards to Units
- Appendix 4B: SVQ

Appendix 1: Mapping of aims to mandatory Units

Group Award title: SQA Advanced Certificate in Petroleum Engineering

Unit code	Unit title	Aim													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
HV4J 47	Science Industry: Key Issues		✓	✓	✓		✓	✓	✓	✓				✓	
HV4P 47	Petroleum Engineering: Physics, Mathematics and Chemistry			✓			✓								✓
HV4R 47	Petroleum Geology and Geophysics: An Introduction			✓	✓	✓	✓		✓				✓		
HV4T 47	Petroleum Reservoir Engineering: An Introduction	✓	✓	✓	✓	✓	✓			✓	✓		✓		
HV4N 47	Oilfield Drilling Techniques and Operations: An Introduction	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓			
HP4A 47	Communication: Practical Skills		✓	✓	✓		✓	✓							
HV4G 47	Petroleum Engineering: Graded Unit 1	✓	✓	✓	✓	✓	✓	✓	✓	⚙	⚙	⚙	⚙	⚙	⚙

 = depends on the case study used for the Graded Unit

SQA Advanced Certificate and Diploma

Group Award title: SQA Advanced Diploma in Petroleum Engineering (Aims 1–14)

Unit code	Unit title	Aim													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
HP4A 47	Communication: Practical Skills		✓	✓	✓		✓	✓							
HR0T 48	Project Management: Managing the Implementation of a Project	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV4J 47	Science Industry: Key Issues		✓	✓	✓		✓	✓	✓	✓				✓	
HP49 47	Engineering Mathematics 2	✓	✓	✓		✓	✓		✓	✓					
HV4P 47	Petroleum Engineering: Physics, Mathematics and Chemistry			✓			✓								✓
HV4R 47	Petroleum Geology and Geophysics: An Introduction			✓	✓	✓	✓		✓				✓		
HV4T 47	Petroleum Reservoir Engineering: An Introduction	✓	✓	✓	✓	✓	✓			✓	✓		✓		
HV4N 47	Oilfield Drilling Techniques and Operations: An Introduction	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓			
HV9H 48	Oilfield Drilling Techniques and Operations		✓	✓	✓		✓		✓	✓	✓	✓			✓
HV5T 48	Oil Well Management	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		
HV9J 48	Petroleum Recovery Techniques		✓	✓	✓	✓	✓		✓	✓	✓		✓		
HV5V 48	Petroleum Production Processes		✓	✓	✓	✓	✓		✓	✓	✓		✓		
HV4G 47	Petroleum Engineering: Graded Unit 1	✓	✓	✓	✓	✓	✓	✓	✓	⚙	⚙	⚙	⚙	⚙	⚙
HV9K 48	Petroleum Engineering: Graded Unit 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

SQA Advanced Certificate and Diploma

Group Award title: SQA Advanced Diploma in Petroleum Engineering (Aims 15 – 25)

Unit code	Unit title	Aim										
		15	16	17	18	19	20	21	22	23	24	25
HP4A 47	Communication: Practical Skills	✓							✓			
HR0T 48	Project Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV4J 47	Science Industry: Key Issues		✓	✓							✓	✓
HP49 47	Engineering Mathematics 2	✓	✓						✓	✓		
HV4P 47	Petroleum Engineering: Physics, Mathematics and Chemistry	✓	✓	✓	✓							
HV4R 47	Petroleum Geology and Geophysics: An Introduction	✓										
HV4T 47	Petroleum Reservoir Engineering: An Introduction		✓	✓	✓	✓						
HV4N 47	Oilfield Drilling Techniques and Operations: An Introduction	✓	✓			✓	✓	✓			✓	✓
HV9H 48	Oilfield Drilling Techniques and Operations		✓				✓	✓			✓	✓
HV5T 48	Oil Well Management	✓	✓	✓				✓			✓	✓
HV9J 48	Petroleum Recovery Techniques	✓	✓					✓			✓	✓
HV5V 48	Petroleum Production Processes	✓		✓			✓	✓				
HV4G 47	Petroleum Engineering: Graded Unit 1	✓	✓	✓	✓	✓	✓	✓	✓	✓		
HV9K 48	Petroleum Engineering: Graded Unit 2	✓	✓	✓	✓	✓	✓	✓	✓	✓		

SQA Advanced Certificate and Diploma

Appendix 2: Core Skills mapping of a Group Award

Group Award title: SQA Advanced Certificate in Petroleum Engineering

Unit Code	Unit Title	Communication		Numeracy		IT	Problem Solving			Working with Others
		Written	Oral	Using Graphical Info.	Using Number		Critical Thinking	Planning and Organising	Reviewing and Evaluating	
HV4J 47	Science Industry: Key Issues	✓	✓	✓		✓				
HV4P 47	Petroleum Engineering: Physics, Mathematics and Chemistry	✓		✓	✓	✓	✓	✓	✓	
HV4R 47	Petroleum Geology and Geophysics: An Introduction	✓		✓	✓	✓				
HV4T 47	Petroleum Reservoir Engineering: An Introduction	✓	✓	✓			✓	✓	✓	
HV4N 47	Oilfield Drilling Techniques and Operations: An Introduction	✓		✓	✓	✓	✓	✓		
HP4A 47	Communication: Practical Skills	✓	✓	✓						✓
HV4G 47	Petroleum Engineering: Graded Unit 1	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV6N 46	Mathematics for Science 1			✓	✓	✓	✓	✓	✓	
HP48 46	Mathematics for Engineering 1: Mechanical and Manufacturing			✓	✓	✓	✓	✓	✓	
HP48 46	Mathematics for Engineering 1			✓	✓	✓	✓	✓	✓	
HP6L 47	Information Technology: Applications Software 1	✓		✓	✓	✓	✓	✓	✓	
HP49 47	Engineering Mathematics 2			✓	✓	✓	✓	✓	✓	
HV49 46	Fundamental Chemistry: An Introduction	✓		✓	✓		✓	✓		
HV4H 47	Fundamental Chemistry: Theory and Practice	✓		✓	✓		✓	✓		
HV4K 47	Engineering Science Principles	✓			✓		✓	✓	✓	

SQA Advanced Certificate and Diploma

Unit code	Unit title	Communication		Numeracy		IT	Problem Solving			Working with Others
		Written	Oral	Using Graphical Info.	Using Number		Critical Thinking	Planning and Organising	Reviewing and Evaluating	
HV0C 47	Process Safety Engineering			✓	✓		✓	✓	✓	
HV3K 47	Electrical Systems in Potentially Explosive and Gas Hazardous Environments	✓	✓	✓			✓	✓	✓	✓
HV4M 47	Environmental Awareness	✓		✓		✓				✓
HT7F 47	Pneumatics and Hydraulics	✓		✓	✓	✓	✓	✓	✓	
HV4L 47	Fire and Gas Detection		✓				✓	✓	✓	✓
HT7R 48	Heat Transfer and Fluid Mechanics	✓		✓	✓	✓	✓	✓	✓	
HV5T 48	Oil Well Management	✓			✓		✓	✓	✓	
HV5V 48	Petroleum Production Processes	✓		✓	✓	✓	✓	✓	✓	

Enter SCQF level, and ✓ for signposted or E for embedded

SQA Advanced Certificate and Diploma

Group Award title: SQA Advanced Diploma in Petroleum Engineering

Unit Code	Unit Title	Communication		Numeracy		IT	Problem Solving			Working with Others
		Written	Oral	Using Graphical Info.	Using Number		Critical Thinking	Planning and Organising	Reviewing and Evaluating	
HP4A 47	Communication: Practical Skills	✓	✓	✓						
HR0T 48	Project Management: Managing the Implementation of a Project	✓		✓	✓	✓	✓	✓	✓	✓
HV4J 47	Science Industry: Key Issues			✓	✓		✓	✓	✓	
HP49 47	Engineering Mathematics 2			✓	✓	✓	✓	✓	✓	
HV4P 47	Petroleum Engineering: Physics, Mathematics and Chemistry	✓		✓	✓	✓	✓	✓	✓	
HV4R 47	Petroleum Geology and Geophysics: An Introduction	✓		✓	✓	✓				
HV4T 47	Petroleum Reservoir Engineering: An Introduction	✓	✓	✓			✓	✓	✓	
HV4N 47	Oilfield Drilling Techniques and Operations: An Introduction	✓		✓	✓	✓	✓	✓		
HV9H 48	Oilfield Drilling Techniques and Operations	✓		✓	✓	✓	✓	✓	✓	
HV5T 48	Oil Well Management	✓		✓	✓	✓	✓	✓	✓	
HV9J 48	Petroleum Recovery Techniques	✓	✓		✓	✓	✓	✓	✓	
HV5V 48	Petroleum Production Processes	✓		✓	✓	✓	✓	✓	✓	
HV4G 47	Petroleum Engineering: Graded Unit 1	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV9K 48	Petroleum Engineering: Graded Unit 2	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV6N 46	Mathematics for Science 1			✓	✓	✓	✓	✓	✓	
HP48 46	Mathematics for Engineering 1: Mechanical and Manufacturing			✓	✓	✓	✓	✓	✓	

SQA Advanced Certificate and Diploma

Group Award title: SQA Advanced Diploma in Petroleum Engineering

Unit Code	Unit Title	Communication		Numeracy		IT	Problem Solving			Working with Others
		Written	Oral	Using Graphical Info.	Using Number		Critical Thinking	Planning and Organising	Reviewing and Evaluating	
HP48 46	Mathematics for Engineering 1			✓	✓	✓	✓	✓	✓	
HV49 46	Fundamental Chemistry: An Introduction	✓			✓		✓	✓	✓	
HP6L 47	Information Technology: Applications Software 1			✓		E	✓	✓	✓	✓
HV4H 47	Fundamental Chemistry: Theory and Practice	✓			✓		✓	✓	✓	
HV4K 47	Engineering Science Principles	✓		✓	✓	✓	✓	✓	✓	
HV0C 47	Process Safety Engineering	✓		✓	✓		✓	✓	✓	
HV3K 47	Electrical Systems in Potentially Explosive and Gas Hazardous Environments	✓	✓		✓		✓	✓	✓	✓
HV0H 47	Quality and Health and Safety Systems in Science Industries	✓	✓	✓		✓				✓
HV4M 47	Environmental Awareness	✓		✓	✓	✓				✓
HT7F 47	Pneumatics and Hydraulics	✓		✓	✓	✓	✓	✓	✓	
HV97 47	Fundamental Concepts of Organic Chemistry	✓			✓		✓	✓	✓	
HV96 47	Fundamental Concepts of Inorganic Chemistry	✓			✓	✓	✓	✓	✓	
HT7K 47	Three Phase Systems	✓			✓	✓	✓	✓	✓	
HV9G 48	Process Operations: Distillation	✓		✓	✓		✓			✓
HV98 47	Fundamental Concepts of Physical Chemistry	✓			✓		✓	✓	✓	
HT7C 47	Thermofluids	✓		✓	✓	✓	✓	✓	✓	
HV65 47	Instrumentation in Hazardous Areas	✓		✓	✓	✓				✓

SQA Advanced Certificate and Diploma

Group Award title: SQA Advanced Diploma in Petroleum Engineering

Unit Code	Unit Title	Communication		Numeracy		IT	Problem Solving			Working with Others
		Written	Oral	Using Graphical Info.	Using Number		Critical Thinking	Planning and Organising	Reviewing and Evaluating	
HV4L 47	Fire and Gas Detection	✓				✓				✓
HT9X 47	Process Control	✓		✓	✓	✓				✓
HT7E 47	Dynamics	✓		✓	✓	✓	✓	✓	✓	
HV9C 48	Electrochemistry	✓			✓	✓	✓	✓	✓	
HV99 48	Thermodynamics and Kinetics	✓		✓	✓	✓	✓	✓	✓	
HV9A 48	Aromatic Chemistry	✓		✓	✓	✓	✓	✓	✓	
HV9D 48	Base-Catalysed Reactions and Organometallic Reagents in Organic Synthesis	✓	✓	✓	✓	✓	✓	✓	✓	
HV9E 48	Phase Equilibrium and Surface Chemistry	✓	✓		✓		✓	✓	✓	
HV9F 48	Organic Stereochemistry	✓			✓		✓	✓	✓	
HT7R 48	Heat Transfer and Fluid Mechanics	✓		✓	✓	✓	✓	✓	✓	
HV60 48	Process Control by Computer	✓			✓	✓	✓	✓	✓	
HV3G 48	Three Phase Induction Motors	✓			✓		✓	✓	✓	
HT7M 48	Electrical Motor Drive Systems	✓			✓		✓	✓	✓	
HT1E 48	Mathematics for Engineering 3			✓	✓	✓	✓	✓	✓	

Enter SCQF level and ✓ for signposted and E for embedded

Appendix 3: Suggested delivery schedule

2 year 2 semester delivery schedule

Year 1 (SQA Advanced Certificate)

Semester 1	Semester 2
Science Industry: Key Issues (HV4J 47)	Engineering Science Principles (HV4K 47)
Petroleum Engineering: Physics, Mathematics and Chemistry (HV4P 47)	Communication: Practical Skills (HP4A 47)
Petroleum Reservoir Engineering: An Introduction (HV4T 47)	Petroleum Production Processes (HV5V 48)
Process Safety Engineering (HV0C 47)	Environmental Awareness (HV4M 47)
Information Technology: Applications Software 1 (HP6L 47)	Pneumatics and Hydraulics (HT7F 47)
Petroleum Geology and Geophysics: An Introduction (HV4R 47)	Oil Well Management (HV5T 48)
Mathematics for Science 1 (HV6N 46) or other from Group B	Petroleum Engineering Graded Unit 1 (HV4G 47)
Oilfield Drilling Techniques and Operations: An Introduction (HV4N 47)	

Year 2 (SQA Advanced Diploma)

Semester 1	Semester 2
Oilfield Drilling Techniques and Operations (HV9H 48)	Petroleum Engineering Graded Unit 2 (HV9K 48)
Petroleum Recovery Techniques (HV9J 48)	Project Management: Managing the Implementation of a Project (HR0T 48)
Engineering Mathematics 2 (HP49 47)	Electrical Systems in Potentially Explosive and Gas Hazardous Environments (HV3K 47)
Thermofluids (HT7C 47)	Process Control by Computer (HV60 48)
Dynamics (HT7E 47)	
Heat Transfer and Fluid Mechanics (HT7R 48)	
Process Control (HT9X 47)	

SQA Advanced Certificate and Diploma

Suggested delivery schedule

2 year 3 block delivery schedule

Year 1 (SQA Advanced Certificate)

Block	SQA Advanced Units				
1	Science Industry: Key Issues HV4J 47	Petroleum Engineering: Physics, Mathematics and Chemistry (HV4P 47)	Petroleum Reservoir Engineering: An Introduction (HV4T 47)	Process Safety Engineering (HV0C 47)	Information Technology: Applications Software 1 (HP6L 47)
2	Petroleum Geology and Geophysics: An Introduction (HV4R 47)	Mathematics for Science 1 (HV6N 46)	Oilfield Drilling Techniques and Operations: An Introduction (HV4N 47)	Engineering Science Principles (HV4K 47)	Communication: Practical Skills (HP4A 47)
3	Petroleum Engineering Graded Unit 1 (HV4G 47)	Pneumatics and Hydraulics (HT7F 47)	Oil Well Management (HV5T 48)	Petroleum Production Processes (HV5V 48)	Environmental Awareness (HV4M 47)

Year 2 (SQA Advanced Diploma)

Block	SQA Advanced Units				
1	Oilfield Drilling Techniques and Operations (HV9H 48)	Petroleum Recovery Techniques (HV9J 48)	Engineering Mathematics 2 (HP49 47)	Thermofluids (HT7C 47)	
2	Project Management: Managing the Implementation of a Project (HR0T 48)	Petroleum Engineering Graded Unit 2 (HV9K 48)	Dynamics (HT7E 47)	Heat Transfer and Fluid Mechanics (HT7R 48)	Process Control (HT9X 47)
3			Electrical Systems in Potentially Explosive and Gas Hazardous Environments (HV3K 47)		Process Control by Computer (HV60 48)

Appendix 4: Links to National Occupational Standards (NOS)

NOS relevant to SQA Advanced Certificate/SQA Advanced Diploma in Petroleum Engineering

1. [Processing Operations Hydrocarbons - Trainee Process Operator involved with Oil & Gas Production](#)
2. [Processing Operations Hydrocarbons - Process Operator involved with Oil & Gas Production](#)
3. [Processing Operations Hydrocarbons - Process Technician involved with Oil & Gas Production](#)
4. [Processing Operations Hydrocarbons - Control Room Operator involved with Oil & Gas Production](#)
5. [Well Services: Electric Logging Well Services Technician Number 1](#)
6. [Well Services: Electric Logging Well Services Technician Number 2](#)
7. [Well Services: Mechanical Wireline Well Services Technician](#)
8. [Well Services: Tubing Operations Well Services Technician](#)
9. [Offshore Drilling Operations - Roughneck, Roustabout](#)
10. [Offshore Drilling Operations - Derrickman](#)
11. [Offshore Drilling Operations - Assistant Driller, Driller](#)
12. [Process Engineering Maintenance \(Mechanical\) - Mechanical Craftsperson](#)
13. [Process Engineering Maintenance \(Mechanical\) - Mechanical Technician](#)
14. [Process Engineering Maintenance \(Instrumentation & Control\) - Instrumentation & Control Craftsperson](#)
15. [Process Engineering Maintenance \(Instrumentation & Control\) - Instrumentation & Control Technician](#)

Appendix 4A: Mapping of National Occupational Standards to Units

Group Award title: SQA Advanced Certificate in Petroleum Engineering (Mandatory Units)

Unit code	Unit title	National Occupational Standard														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
HV4J 47	Science Industry: Key Issues	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV4P 47	Petroleum Engineering: Physics, Mathematics and Chemistry	✓	✓	✓	✓					✓	✓	✓				
HV4R 47	Petroleum Geology and Geophysics: An Introduction	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV4T 47	Petroleum Reservoir Engineering: An Introduction	✓	✓	✓	✓	✓	✓									
HV4N 47	Oilfield Drilling Techniques and Operations: An Introduction	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
HP4A 47	Communication: Practical Skills	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV4G 47	Petroleum Engineering Graded Unit 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV6N 46	Mathematics for Science 1	✓	✓	✓	✓								✓	✓	✓	✓
HP48 46	Mathematics for Engineering 1: Mechanical and Manufacturing	✓	✓	✓	✓								✓	✓	✓	✓
HP48 46	Mathematics for Engineering 1	✓	✓	✓	✓								✓	✓	✓	✓

SQA Advanced Certificate and Diploma

Group Award title: SQA Advanced Diploma in Petroleum Engineering

Unit code	Unit title	National Occupational Standard														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
HP4A 47	Communication: Practical Skills	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HR0T 48	Project Management: Managing the Implementation of a Project	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV4J 47	Science Industry: Key Issues	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HP49 47	Engineering Mathematics 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV4P 47	Petroleum Engineering: Physics, Mathematics and Chemistry	✓	✓	✓	✓					✓	✓	✓				
HV4R 47	Petroleum Geology and Geophysics: An Introduction	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV4T 47	Petroleum Reservoir Engineering: An Introduction	✓	✓	✓	✓	✓	✓									
HV4N 47	Oilfield Drilling Techniques and Operations: An Introduction	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
HV9H 48	Oilfield Drilling Techniques and Operations	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
HV5T 48	Oil Well Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV9J 48	Petroleum Recovery Techniques	✓	✓	✓	✓											
HV5V 48	Petroleum Production Processes	✓	✓	✓	✓								✓	✓	✓	✓
HV4G 47	Petroleum Engineering: Graded Unit 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV9K 48	Petroleum Engineering: Graded Unit 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
HV6N 46	Mathematics for Science 1	✓	✓	✓	✓								✓	✓	✓	✓
HP48 46	Mathematics for Engineering 1: Mechanical and Manufacturing	✓	✓	✓	✓								✓	✓	✓	✓
HP48 46	Mathematics for Engineering 1	✓	✓	✓	✓								✓	✓	✓	✓

Appendix 4B: SVQ

Processing Operations: Hydrocarbons (level 3) links to Generic Course Unit Areas

SQA Group Award No: G8M8 23

SQA Group Award Title: Processing Operations: Hydrocarbons (level 3)

VQ Element	SQA Code and Title (Unit Element)
C2 C2.1 C2.2	F225 04 Monitor and Maintain Health, Environment and Safety Systems Administer the safe systems of work process Maintain the necessary conditions for an effective and safe working environment
C5 C5.1 C5.2 C5.3	B1AV 04 Control of Emergencies and Critical Situations Maintain a state of readiness Control critical situations Co-ordinate the response to emergencies
C7 C7.1 C7.2 C7.3	F228 04 Create, Maintain and Enhance Productive Working Relationships With Others Create and enhance productive working relationships Enhance productive working relationships with one's immediate manager Carry out work handovers
PT3.1 PT3.1.1 PT3.1.2	F22K 04 Prepare and Start Up Integrated Process Systems Prepare to carry out a production process Start up integrated process systems
PT3.2 PT3.2.1 PT3.2.2	AY1G 04 Operate and Monitor Integrated Process Systems Operate integrated process systems Monitor integrated process systems
PT3.3 PT3.3.1 PT3.3.2	F22G 04 Prepare and Shut Down Integrated Process Systems Prepare for integrated process system shutdown Shut down the integrated process system
PT3.4 PT3.4.1 PT3.4.2	D7SB 04 Isolate and Reinstat e Process Plant and Equipment Co-ordinate the isolation of plant and equipment for maintenance Co-ordinate the de-isolation of plant and equipment for maintenance

SQA Advanced Certificate and Diploma

Mapping between SQA Advanced Certificate/SQA Advanced Diploma in Petroleum Engineering Course Areas and SVQ Processing Operations: Hydrocarbons (G8M8 23)

VQ Element	Exploitation		Extraction		Purification		Transport, Storage and Distribution
	Geology	Exp Dr	Adv Dr	Dr Ops	Dist	Recovery	
C2.1	✓	✓	✓	✓	✓	✓	✓
C2.2	✓	✓	✓	✓	✓	✓	✓
C5.1			✓	✓	✓	✓	
C5.2			✓	✓	✓	✓	
C5.3		✓	✓		✓	✓	✓
C7.1	✓	✓	✓	✓	✓	✓	✓
C7.2	✓	✓	✓	✓	✓	✓	✓
C7.3	✓	✓	✓	✓	✓	✓	✓
PT3.1.1	✓	✓		✓	✓	✓	
PT3.1.2	✓	✓	✓	✓	✓	✓	✓
PT3.2.1	✓	✓	✓	✓	✓	✓	✓
PT3.2.2		✓	✓	✓	✓	✓	✓
PT3.3.1			✓		✓	✓	✓
PT3.3.2			✓		✓	✓	✓
PT3.4.1			✓		✓	✓	✓
PT3.4.2			✓		✓	✓	✓