



Group Award Specification for:

**SQA Advanced Certificate in Chemical Process
Technology at SCQF level 7**

Group Award Code: GN10 47

**SQA Advanced Diploma in Chemical Process
Technology at SCQF level 8**

Group Award Code: GM9W 48

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1 Introduction

This is the Group Award Specification for the SQA Advanced Certificate in Chemical Process Technology and the SQA Advanced Diploma in Chemical Process Technology. This document includes background information on the group awards, their aims, details of the group award structures, and guidance on delivery.

The SQA Advanced Certificate and SQA Advanced Diploma in Chemical Process Technology allow learners to gain skills and knowledge in Chemical Engineering, Chemical Processing and Chemistry and the essential skills necessary for further articulation to SQA Advanced Diploma or degree programmes in relevant subject areas.

Qualifications Design Teams (QDT) were created to support the development process in consultation with employers and higher education colleagues and further education partners. In designing the Group Awards, the QDT has been fully aware of the need for the Group Awards to contain relevant technical and transferable skills to enable immediate entry to employment while at the same time allowing articulation to degree courses. The QDT believes that an appropriate balance between academic and vocational knowledge and skills has been achieved throughout the mix of Unit content and potential teaching approaches.

The Group Awards are designed for both full and part-time learners and the target audience is those who wish to progress to further study or to take up a career in the chemicals sector or as process technicians in a range of industrial sectors.

The theoretical content may be delivered by open and distance learning methods, provided that adequate preparations are made. Additional planning and resources will be needed for learner support and assessment. Quality assurance procedures must also be sufficient and robust to support open and distance learning.

The Group Awards are designed as discrete, specialised qualifications to equip learners with the knowledge, skills and understanding required for employment or progression to further academic study, and may be seen to be supporting the national strategies and drivers as outlined below.

A range of industrial sectors require skilled process technicians and chemical engineers. These industries are not only chemical sector companies, but also life sciences companies, food and drink companies and industrial biotechnology companies. These Group Awards are designed to meet the needs of these industries.

2 Qualification structure

SQA Advanced Certificate in Chemical Process Technology

Mandatory Units (6 credits)

Code		Unit title	SCQF level	SCQF credit points	SQA credit
HV00	47	Fundamental Chemistry: Theory and Laboratory Skills	7	16	2
HV0L	47	Organic Chemistry: Theory and Laboratory Skills	7	8	1
HV0M	47	Physical Chemistry: Theory and Laboratory Skills	7	8	1
HV0R	47	Chemical Process Technology: Graded Unit 1	7	8	1
HV03	47	Chemical Engineering: Principles	7	8	1

Mandatory Units (2-3 credits)

Code		Unit title	SCQF level	SCQF credit points	SQA credit
HV0C	47	Process Safety Engineering	7	8	1
HV09	47	Heat Transfer Theory and Practical Skills	7	8	1
HV0A	47	Fluid Mechanics: Theory and Laboratory Skills	7	8	1

Mandatory Units (1-2 credits)

Code		Unit title	SCQF level	SCQF credit points	SQA credit
HP48	46	Engineering Mathematics 1	6	8	1
HP49	47	Engineering Mathematics 2	7	8	1

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Optional Section A (0–3 credits)

Code		Unit title	SCQF level	SCQF credit points	SQA credit
HV0D	47	Industrial Chemicals: Processes and Products	7	8	1
HV0P	47	Physics Principles: Mechanics	7	8	1
HV0N	47	Physics Principles: Heat and Thermodynamics	7	8	1
HV0H	47	Quality and Health & Safety Systems in Science Industries	7	8	1
HV0G	46	Fundamental Chemistry: An Introduction	6	8	1
HV10	48	Instrumental Techniques 1	8	8	1
HT1M	47	Engineering Mathematics 3	7	8	1
HP6L	47	Information Technology: Applications Software 1	7	8	1
HV0K	47	Inorganic Chemistry: Theory and Laboratory Skills	7	8	1
HV0J	47	Laboratory Skills for Science Industries	7	16	2
HV05	47	Industrial Biotechnology: Processing	7	8	1

Optional Section B — Broadening Units (0–1 credit)

Code		Unit title	SCQF level	SCQF credit points	SQA credit
HR1C	46	Workplace Communication in English	6	8	1
HP6M	47	Personal Development Planning	7	8	1

This Group Award is made up of 12 SQA Unit credits, and comprises 96 SCQF credit points. A minimum of 72 SCQF credit points are required from the mandatory sections. Learners then select optional Units from the remaining sections to complete the total of 96 SCQF credit points. Depending on the SCQF credit points achieved from the mandatory sections, a further 8–24 SCQF credit points are required from the optional Sections A–B.

The *Chemical Process Technology: Graded Unit 1* is an investigative report. The purpose of the *Chemical Process Technology: Graded Unit 1* is to assess the learner's ability to integrate and apply the knowledge and skills gained in the individual Units to demonstrate that they have achieved the specific aims of the Group Award and to grade learner achievement.

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SQA Advanced Diploma in Chemical Process Technology

Mandatory Units (20 credits)

Code		Unit title	SCQF level	SCQF credit points	SQA credit
HV00	47	Fundamental Chemistry: Theory and Laboratory Skills	7	16	2
HV0L	47	Organic Chemistry: Theory and Laboratory Skills	7	8	1
HV0M	47	Physical Chemistry: Theory and Laboratory Skills	7	8	1
HV0R	47	Chemical Process Technology: Graded Unit 1	7	8	1
HV03	47	Chemical Engineering: Principles	7	8	1
HV0W	48	Aromatic Chemistry: Theory and Laboratory Skills	8	8	1
HV0T	48	Chemical Process Technology: Graded Unit 2	8	16	2
HV07	48	Process Operations: Heat Exchange, Drying and Evaporation	8	8	1
HV0A	47	Fluid Mechanics: Theory and Laboratory Skills	7	8	1
HV10	48	Instrumental Techniques 1	8	8	1
HV0D	47	Industrial Chemicals: Processes and Products	7	8	1
HV0C	47	Process Safety Engineering	7	8	1
HV06	48	Process Operations: Distillation	8	8	1
HV15	48	Thermodynamics and Kinetics: Theory and Laboratory Skills	8	8	1
HV09	47	Heat Transfer Theory and Practical Skills	7	8	1
HV14	48	Phase Equilibrium and Surface Chemistry	8	8	1
HV0X	48	Base-Catalysed and Organometallic Chemistry: Theory and Laboratory Skills	8	8	1
HV0K	47	Inorganic Chemistry: Theory and Laboratory Skills	7	8	1

Mandatory Units (2–3 credits)

Code		Unit title	SCQF level	SCQF credit points	SQA credit
HP48	46	Engineering Mathematics 1	6	8	1
HP49	47	Engineering Mathematics 2	7	8	1
HT1M	47	Engineering Mathematics 3	7	8	1

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Optional Section A (3–8 credits)

Code		Unit title	SCQF level	SCQF credit points	SQA credit
HV11	48	Instrumental Techniques 2	8	8	1
HV12	48	Main Group Inorganic Chemistry	8	8	1
HV0Y	48	Electrochemistry	8	8	1
HV13	48	Organic Stereochemistry: Theory and Laboratory Skills	8	8	1
HV0N	47	Physics Principles: Heat and Thermodynamics	7	8	1
HV02	47	Fermentation Engineering	7	8	1
HV0E	47	Process Water and Steam Services	7	8	1
HV01	47	Chemical Engineering: Applied Physical Chemistry	7	8	1
HR3L	47	CAD: 2D I	7	8	1
HV0P	47	Physics Principles: Mechanics	7	8	1
HV0H	47	Quality and Health & Safety Systems in Science Industries	7	8	1
HV0G	46	Fundamental Chemistry: An Introduction	6	8	1
HV16	48	Transition Metal Chemistry: Theory and Laboratory Skills	8	8	1
HV0V	48	Environmental Sampling and Analysis	8	8	1
HV05	47	Industrial Biotechnology: Processing	7	8	1
HV0J	47	Laboratory Skills for Science Industries	7	16	2
HT03	48	Engineering Mathematics 4	8	8	1
HT1N	48	Engineering Mathematics 5	8	8	1
HP6L	47	Information Technology: Applications Software 1	7	8	1

Optional Section B — Broadening Units (0–4 credits)

Code		Unit title	SCQF level	SCQF credit points	SQA credit
HR1C	46	Workplace Communication in English	6	8	1
HR1G	47	ESOL for Work: Advanced Operational	7	24	3
HP6M	47	Personal Development Planning	7	8	1
HR0M	47	Work Role Effectiveness	7	24	3
HR0P	48	Work Role Effectiveness	8	24	3

This Group Award is made up of 30 SQA Unit credits, and comprises 240 SCQF credit points. 176 SCQF credit points are required from the mandatory sections. Learners then select optional Units from the remaining sections to complete the total of 240 SCQF credit points. Depending on the SCQF credit points achieved from the mandatory sections, a further 56–64 SCQF credit points are required from the optional Sections A–B.

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The *Chemical Process Technology: Graded Unit 1* is an investigative report. The purpose of the *Chemical Process Technology: Graded Unit 1* is to assess the learner's ability to integrate and apply the knowledge and skills gained in the individual Units to demonstrate that they have achieved the specific aims of the Group Award and to grade learner achievement.

The *Chemical Process Technology: Graded Unit 2* is a laboratory based project, with an associated report. The purpose of the *Chemical Process Technology: Graded Unit 2* is to assess the learner's abilities in integrating and applying knowledge and skills, and to also develop high level advanced and independent practical skills.

3 Aims of the qualifications

The overall aim of the SQA Advanced Certificate and SQA Advanced Diploma in Chemical Process Technology is to provide a progressive, integrated and coherent education which will be responsive to the needs of learners, employers and higher institutions.

3.1 General aims of the qualifications

The general aims of the SQA Advanced Certificate/Diploma in Chemical Process Technology are to develop:

- ◆ knowledge of study, research and analysis
- ◆ ability to define and solve problems
- ◆ transferable skills
- ◆ ability to be flexible and work co-operatively with others
- ◆ responsibility for own learning
- ◆ planning, organisation and review/evaluation skills
- ◆ oral and written scientific communication skills
- ◆ numerical and ICT skills
- ◆ employability skills
- ◆ flexibility, knowledge, skills and motivation as a basis for progression to further study within SQA Advanced Qualifications and/or graduate studies

3.2 Specific aims of the qualifications

The aims of the SQA Advanced Certificate/SQA Advanced Diploma in Chemical Process Technology specify the knowledge and skills required to be deemed competent in this subject area/occupational area.

SQA Advanced Certificate in Chemical Process Technology

The specific aims of the SQA Advanced Certificate in Chemical Process Technology are to:

- ◆ Prepare learners for an appropriate level of employment, in areas of the chemical sector such as laboratories, chemicals production, pharmaceutical, food and agriculture production and environmental science.
- ◆ Develop a range of contemporary vocational skills relating to the use, support and development of systems appropriate to employment at technician or professional level.
- ◆ Provide learners with a range of skills to support learning in relevant SVQ 3 level programmes.
- ◆ Provide learners with an element of vocational specialisation in a variety of areas such as laboratory work, chemical production, agriculture, energy and environmental science.

SQA Advanced Certificate and Diploma

- ◆ Prepare learners for progression to further studies in process engineering, chemical engineering and related disciplines.
- ◆ Provide a flexible route to the Group Award, allowing access to those in employment through part-time study and full-time provision.
- ◆ Provide an opportunity for learners to discover which areas of chemical process most interest them by providing experience of each of the main branches of the subject area which is diverse and varied.
- ◆ Provide a wider range of practical laboratory skills to enhance job prospects through the practical content of the course.
- ◆ Provide learners with a sound academic basis for the continuing development of practical and conceptual skills.

SQA Advanced Diploma in Chemical Process Technology

The specific aims of the SQA Advanced Diploma in Chemical Process Technology are to:

- ◆ Prepare learners for an appropriate level of employment, in areas of the chemical sector such as laboratories, chemicals production, pharmaceutical, food and agriculture production and environmental science.
- ◆ Develop a range of contemporary vocational skills relating to the use, support and development of systems appropriate to employment at technician or professional level.
- ◆ Provide learners with a range of study and research skills, including to support learning in relevant SVQ 4 level programmes.
- ◆ Provide learners with an element of vocational specialisation in a variety of areas such as laboratory work, chemical production, agriculture, energy and environmental science.
- ◆ Prepare learners for progression to further studies in process engineering, chemical engineering and related disciplines, including direct entry to stage 3 degree.
- ◆ Provide a flexible route to the Group Award, allowing access to those in employment through part-time study and full-time provision.
- ◆ Provide an opportunity for learners to discover which areas of chemical process most interest them by providing experience of each of the main branches of the subject area which is diverse and varied.
- ◆ Provide a wider range of practical laboratory skills to enhance job prospects through the practical content of the course. These skills should be at SCQF level 8.
- ◆ Continue development of practical and conceptual skills from SCQF level 7 to SCQF level 8.

3.3 Graded Units

The purpose of the Graded Units is to assess the learner's ability to integrate and apply the knowledge and skills gained in individual Units to demonstrate that they have achieved the specific aims of the Group Awards.

Learners will undertake the 1 credit *Chemical Process Technology: Graded Unit 1* at SCQF level 7 for the SQA Advanced Certificate in Chemical Process Technology. Learners will undertake the 2 credit *Chemical Process Technology: Graded Unit 2* at SCQF level 8 along with the *Chemical Process Technology: Graded Unit 1* at SCQF level 7 to complete the SQA Advanced Diploma in Chemical Process Technology.

The *Chemical Process Technology: Graded Unit 1* will take the form of an investigation report. It will cover a range of skills achieved through studying the mandatory Units within the Group Award. It allows learners to use research skills, set timescales, identify main issues, methods and sources of research and develop scientific reporting skills.

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Learners will be required to produce reports covering planning, development and evaluation of the investigation.

The *Chemical Process Technology: Graded Unit 1* is designed to provide evidence that the learner has achieved the following aims of the SQA Advanced Certificate in Chemical Process Technology:

- ◆ develop learners' knowledge and skills such as planning, developing and evaluating
- ◆ develop employment skills and enhancing learners' employment prospects
- ◆ enable progression within the Scottish Credit and Qualifications Framework (SCQF)
- ◆ develop transferable skills including Core Skills
- ◆ prepare for employment in a chemical process technology or related post at technician or professional level
- ◆ develop a range of vocational skills appropriate to employment at technician or professional level in the chemical science sector

The *Chemical Process Technology: Graded Unit 2* at SCQF level 8 will take the form of a laboratory based project with an associated investigation report. It allows learners to use research skills, set timescales, identify main issues, methods and sources of research and develop scientific reporting skills.

Learners will be required to produce reports covering planning, development and evaluation of the investigation.

The *Chemical Process Technology: Graded Unit 2* is designed to provide evidence that the learner has achieved the following aims of the SQA Advanced Diploma in Chemical Process Technology:

- ◆ prepare learners for an appropriate level of employment
- ◆ develop a range of contemporary vocational skills including investigative skills, developing health and safety skills in a practical environment or as part of a design project and enhancing risk assessment skills
- ◆ prepare learners for progression to further studies
- ◆ provide learners with a wider range of practical laboratory skills or process equipment/plant design skills
- ◆ develop study and research skills
- ◆ develop Core Skills such as *Working with Others* in a team environment

In addition, for both *Chemical Process Technology: Graded Unit 1* and *Chemical Process Technology: Graded Unit 2* the learner will develop a variety of supplementary skills which enhance life skills and the educational experience. These skills are associated with enterprise, employability, sustainability, and citizenship.

4 Recommended entry to the qualifications

Entry to this qualification is at the discretion of the centre. The following information on prior knowledge, skills, experience or qualifications that provide suitable preparation for this qualification has been provided by the Qualification Design Team (QDT) as guidance only.

Learners would benefit from having attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and/or experience:

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The following qualifications are given as guidelines only:

- ◆ A minimum of two Highers from Chemistry, Mathematics or Physics at Grade C or above, with appropriate supporting passes at National 5 level (or equivalent SCQF level 5) in appropriate science subjects and Mathematics.
- ◆ NC Applied Sciences level 6
- ◆ Qualifications in appropriate science, chemical process technology and mathematics programmes, such as Access programmes. Learners should have gained some Units at Higher level in appropriate science, chemical process technology and mathematics programmes.
- ◆ Suitable work experience, gained in a chemical process setting.

It is intended that admission to the SQA Advanced Certificate/SQA Advanced Diploma in Chemical Process Technology should be as broadly based as possible, but that this should be consistent with the selection of learners who have the appropriate knowledge and skills to successfully achieve the SQA Advanced Certificate/SQA Advanced Diploma in Chemical Process Technology.

4.1 Core Skills entry profile

The Core Skills entry profile provides a summary of the associated assessment activities that exemplify why a particular level has been recommended for this qualification. The information below should be used to identify if additional learning support needs to be put in place for learners whose Core Skills profile is below the recommended entry level or whether learners should be encouraged to do an alternative level or learning programme.

It should be noted that although there is no mandatory entry and exit levels the following is recommended:

Core Skill	Recommended SCQF entry profile	Associated assessment activities
Communication	SCQF level 5	Research, analysis, report, oral presentation.
Numeracy	SCQF level 5	Numerical and graphical presentation, numerical and algebraic calculations.
Information and Communication Technology (ICT)	SCQF level 5	Accessing information for research purposes, assimilation and analysis of research information. Creation of graphical and narrative material for report and presentation purposes.
Problem Solving	SCQF level 5	Critical thinking, planning and evaluation.
Working with Others	SCQF level 4	Co-operative working as part of a team for practical activities.

5 Additional benefits of the qualification in meeting employer needs

These qualifications were designed to meet a specific purpose and what follows are details on how that purpose has been met through mapping of the Units to the aims of the qualification. Through meeting the aims, additional value has been achieved by linking the Unit standards with those defined in National Occupational Standards and/or trade/professional body requirements. In addition, significant opportunities exist for learners to develop the more generic skills, known as Core Skills, through doing these qualifications.

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5.1 Mapping of qualification aims to Units

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Code	Unit title	General Aims										
		1	2	3	4	5	6	7	8	9	10	
HV00 47	Fundamental Chemistry: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X	X
HV0L 47	Organic Chemistry: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X	X
HV0M 47	Physical Chemistry: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X	X
HV0R 47	Chemical Process Technology: Graded Unit 1	X	X	X		X	X	X	X	X	X	X
HV03 47	Chemical Engineering: Principles	X	X	X		X			X	X	X	X
HV0C 47	Process Safety Engineering	X	X	X		X			X	X	X	X
HV09 47	Heat Transfer Theory and Practical Skills	X	X	X	X	X	X	X	X	X	X	X
HV0A 47	Fluid Mechanics: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X	X
HP48 46	Engineering Mathematics 1	X	X	X		X	X		X	X	X	X
HP49 47	Engineering Mathematics 2	X	X	X		X	X		X	X	X	X
HV0D 47	Industrial Chemicals: Processes and Products	X	X	X		X			X	X	X	X
HV0P 47	Physics Principles: Mechanics	X	X	X	X	X	X	X	X	X	X	X
HV0N 47	Physics Principles: Heat and Thermodynamics	X	X	X	X	X	X	X	X	X	X	X
HV0H 47	Quality and Health & Safety Systems in Science Industries	X	X	X		X	X	X	X	X	X	X

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Code	Unit title	General Aims										
		1	2	3	4	5	6	7	8	9	10	
HV0G 46	Fundamental Chemistry: An Introduction	X	X	X	X	X	X	X	X	X	X	X
HV10 48	Instrumental Techniques 1	X	X	X	X	X	X	X	X	X	X	X
HT1M 47	Engineering Mathematics 3	X	X	X		X	X		X	X	X	
HP6L 47	Information Technology: Applications Software 1		X	X		X	X		X	X	X	
HV0K 47	Inorganic Chemistry: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X	X
HV0J 47	Laboratory Skills for Science Industries	X	X	X	X	X	X	X	X	X	X	X
HV05 47	Industrial Biotechnology: Processing	X	X	X		X			X	X	X	
HR1C 46	Workplace Communication in English	X		X	X	X	X	X	X	X	X	X
HP6M 47	Personal Development Planning		X	X		X	X		X	X	X	

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Code	Unit title	General Aims									
		1	2	3	4	5	6	7	8	9	10
HV00 47	Fundamental Chemistry: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X
HV0L 47	Organic Chemistry: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X
HV0M 47	Physical Chemistry: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X
HV0R 47	Chemical Process Technology: Graded Unit 1	X	X	X		X	X	X	X	X	X
HV03 47	Chemical Engineering: Principles	X	X	X		X			X	X	X
HV0W 48	Aromatic Chemistry: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X
HV0T 48	Chemical Process Technology: Graded Unit 2	X	X	X	X	X	X	X	X	X	X
HV07 48	Process Operations: Heat Exchange, Drying and Evaporation	X	X	X		X			X	X	X
HV0A 47	Fluid Mechanics: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X
HV10 48	Instrumental Techniques 1	X	X	X	X	X	X	X	X	X	X
HV0D 47	Industrial Chemicals: Processes and Products	X	X	X		X			X	X	X
HV0C 47	Process Safety Engineering	X	X	X		X			X	X	X
HV06 48	Process Operations: Distillation	X	X	X	X	X	X	X	X	X	X
HV15 48	Thermodynamics and Kinetics: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X

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Code	Unit title	General Aims										
		1	2	3	4	5	6	7	8	9	10	
HV09 47	Heat Transfer Theory and Practical Skills	X	X	X	X	X	X	X	X	X	X	X
HV14 48	Phase Equilibrium and Surface Chemistry	X	X	X	X	X	X	X	X	X	X	X
HV0X 48	Base-Catalysed and Organometallic Chemistry: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X	X
HV0K 47	Inorganic Chemistry: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X	X
HP48 46	Engineering Mathematics 1	X	X	X		X	X		X	X	X	
HP49 47	Engineering Mathematics 2	X	X	X		X	X		X	X	X	
HT1M 47	Engineering Mathematics 3	X	X	X		X	X		X	X	X	
HV11 48	Instrumental Techniques 2	X	X	X	X	X	X	X	X	X	X	X
HV12 48	Main Group Inorganic Chemistry	X	X	X	X	X	X	X	X	X	X	X
HV0Y 48	Electrochemistry	X	X	X	X	X	X	X	X	X	X	X
HV13 48	Organic Stereochemistry: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X	X
HV0N 47	Physics Principles: Heat and Thermodynamics	X	X	X	X	X	X	X	X	X	X	X
HV02 47	Fermentation Engineering	X	X	X		X	X		X	X	X	
HV0E 47	Process Water and Steam Services	X	X	X		X	X		X	X	X	
HV01 47	Chemical Engineering: Applied Physical Chemistry	X	X	X		X			X	X	X	
HR3L 47	CAD: 2D I	X	X	X		X			X	X	X	

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Code	Unit title	General Aims										
		1	2	3	4	5	6	7	8	9	10	
HV0P 47	Physics Principles: Mechanics	X	X	X	X	X	X	X	X	X	X	X
HV0H 47	Quality and Health & Safety Systems in Science Industries	X	X	X		X	X	X	X	X	X	X
HV0G 46	Fundamental Chemistry: An Introduction	X	X	X	X	X	X	X	X	X	X	X
HV16 48	Transition Metal Chemistry: Theory and Laboratory Skills	X	X	X	X	X	X	X	X	X	X	X
HV0V 48	Environmental Sampling and Analysis	X	X	X	X	X	X	X	X	X	X	X
HV05 47	Industrial Biotechnology: Processing	X	X	X		X			X	X	X	
HV0J 47	Laboratory Skills for Science Industries	X	X	X	X	X	X	X	X	X	X	X
HT03 48	Engineering Mathematics 4	X	X	X		X	X		X	X	X	
HT1N 48	Engineering Mathematics 5	X	X	X		X	X		X	X	X	
HP6L 47	Information Technology: Applications Software 1		X	X		X	X		X	X	X	
HR1C 46	Workplace Communication in English	X		X	X	X	X	X	X	X	X	X
HR1G 47	ESOL for Work: Advanced Operational	X		X	X	X	X	X	X	X	X	X
HP6M 47	Personal Development Planning		X	X		X	X		X	X	X	
HR0M 47	Work Role Effectiveness	X	X	X	X	X	X	X	X	X	X	X
HR0P 48	Work Role Effectiveness	X	X	X	X	X	X	X	X	X	X	X

5.2 Mapping of National Occupational Standards (NOS)

The SQA Advanced Certificate/SQA Advanced Diploma in Chemical Process Technology have been mapped against the level 4 SVQ Life Sciences and Related Industries.

Code	National Occupational Standard	Aromatic Chemistry: Theory and Laboratory Skills (HV0W 48)	Base-Catalysed and Organometallic Chemistry: Theory and Laboratory Skills (HV0X 48)	Chemical Engineering: Principles (HV03 47)	Engineering Mathematics 1 (HP48 46)	Engineering Mathematics 2 (HP49 47)	Engineering Mathematics 3 (HT1M 47)	Fluid Mechanics: Theory and Laboratory Skills (HV0A 47)	Fundamental Chemistry: Theory and Laboratory Skills (HV00 47)	Heat Transfer Theory and Practical Skills (HV09 47)	Industrial Chemicals: Processes and Products (HV0D 47)	Inorganic Chemistry: Theory and Laboratory Skills (HV0K 47)	Instrumental Techniques 1 (HV10 48)	Organic Chemistry: Theory and Laboratory Skills (HV0L 47)	Phase Equilibrium and Surface Chemistry (HV14 48)	Physical Chemistry: Theory and Laboratory Skills (HV0M 47)	Process Operations: Distillation (HV06 48)	Process Operations: Heat Exchange, Drying and Evaporation (HV07 48)	Process Safety Engineering (HV0C 47)	Thermodynamics and Kinetics: Theory and Laboratory Skills (HV15 48)
H6F2 04	Maintain Effective and Efficient Working Relationships	X	X					X	X	X		X	X	X	X	X				X
H6FC 04	Preparing Reagents	X	X						X			X	X	X						
H6FK 04	Provide Technical Support for Computer Application Software and Equipment																			
H6FN 04	Provide Technical Advice and Guidance																			

SQA Advanced Certificate and Diploma

Code	National Occupational Standard	Aromatic Chemistry: Theory and Laboratory Skills (HV0W 48)	Base-Catalysed and Organometallic Chemistry: Theory and Laboratory Skills (HV0X 48)	Chemical Engineering: Principles (HV03 47)	Engineering Mathematics 1 (HP48 46)	Engineering Mathematics 2 (HP49 47)	Engineering Mathematics 3 (HT1M 47)	Fluid Mechanics: Theory and Laboratory Skills (HV0A 47)	Fundamental Chemistry: Theory and Laboratory Skills (HV00 47)	Heat Transfer Theory and Practical Skills (HV09 47)	Industrial Chemicals: Processes and Products (HV0D 47)	Inorganic Chemistry: Theory and Laboratory Skills (HV0K 47)	Instrumental Techniques 1 (HV10 48)	Organic Chemistry: Theory and Laboratory Skills (HV0L 47)	Phase Equilibrium and Surface Chemistry (HV14 48)	Physical Chemistry: Theory and Laboratory Skills (HV0M 47)	Process Operations: Distillation (HV06 48)	Process Operations: Heat Exchange, Drying and Evaporation (HV07 48)	Process Safety Engineering (HV0C 47)	Thermodynamics and Kinetics: Theory and Laboratory Skills (HV15 48)
H6FP 04	Prepare New Methods, Resources and Equipment for Learning Activities																			
H6FR 04	Improve the Quality and Reliability of Activities																			
H6FV 04	Amplifying and Analysing DNA or RNA Samples using PCR or qPCR																			
H6FW 04	Analysing Samples using Light Microscopy								X											
H6FY 04	Analysis of DNA using Gel Electrophoresis												X							
H6G0 04	Plan and Collect Samples for Testing																			

SQA Advanced Certificate and Diploma

Code	National Occupational Standard	Aromatic Chemistry: Theory and Laboratory Skills (HV0W 48)	Base-Catalysed and Organometallic Chemistry: Theory and Laboratory Skills (HV0X 48)	Chemical Engineering: Principles (HV03 47)	Engineering Mathematics 1 (HP48 46)	Engineering Mathematics 2 (HP49 47)	Engineering Mathematics 3 (HT1M 47)	Fluid Mechanics: Theory and Laboratory Skills (HV0A 47)	Fundamental Chemistry: Theory and Laboratory Skills (HV00 47)	Heat Transfer Theory and Practical Skills (HV09 47)	Industrial Chemicals: Processes and Products (HV0D 47)	Inorganic Chemistry: Theory and Laboratory Skills (HV0K 47)	Instrumental Techniques 1 (HV10 48)	Organic Chemistry: Theory and Laboratory Skills (HV0L 47)	Phase Equilibrium and Surface Chemistry (HV14 48)	Physical Chemistry: Theory and Laboratory Skills (HV0M 47)	Process Operations: Distillation (HV06 48)	Process Operations: Heat Exchange, Drying and Evaporation (HV07 48)	Process Safety Engineering HV0C 47)	Thermodynamics and Kinetics: Theory and Laboratory Skills (HV15 48)
H6G1 04	Carry out Investigation	X	X					X	X	X		X	X	X	X	X			X	X
H6G2 04	Analysis of Samples using High Performance Liquid Chromatography								X				X							
H6G3 04	Analysis of Samples using Spectroscopy								X				X							
H6G4 04	Analysis of Samples using Gas Chromatography								X				X							
H6G5 04	Applying Basic Statistics																			
H6G6 04	Develop and Provide Training																			
H6G7 04	Culturing or Fermenting Cells																			
H6G8 04	Develop and Maintain Health and Safety Procedures																			

SQA Advanced Certificate and Diploma

Code	National Occupational Standard	Aromatic Chemistry: Theory and Laboratory Skills (HV0W 48)	Base-Catalysed and Organometallic Chemistry: Theory and Laboratory Skills (HV0X 48)	Chemical Engineering: Principles (HV03 47)	Engineering Mathematics 1 (HP48 46)	Engineering Mathematics 2 (HP49 47)	Engineering Mathematics 3 (HT1M 47)	Fluid Mechanics: Theory and Laboratory Skills (HV0A 47)	Fundamental Chemistry: Theory and Laboratory Skills (HV00 47)	Heat Transfer Theory and Practical Skills (HV09 47)	Industrial Chemicals: Processes and Products (HV0D 47)	Inorganic Chemistry: Theory and Laboratory Skills (HV0K 47)	Instrumental Techniques 1 (HV10 48)	Organic Chemistry: Theory and Laboratory Skills (HV0L 47)	Phase Equilibrium and Surface Chemistry (HV14 48)	Physical Chemistry: Theory and Laboratory Skills (HV0M 47)	Process Operations: Distillation (HV06 48)	Process Operations: Heat Exchange, Drying and Evaporation (HV07 48)	Process Safety Engineering (HV0C 47)	Thermodynamics and Kinetics: Theory and Laboratory Skills (HV15 48)
H6G9 04	Make Presentations in the Work Place																	X		
H6GA 04	Managing Budgets																			
H6GB 04	Providing Leadership																			
H6GC 04	Encourage Problem Solving and Innovation																			
H6GD 04	Establish and Implement Quality Assurance Processes																			

SQA Advanced Certificate and Diploma

The SQA Advanced Certificate/SQA Advanced Diploma in Chemical Process Technology have also been mapped against the level 3 SVQ Process Industries Operations.

National Occupational Standard	Aromatic Chemistry: Theory and Laboratory Skills (HV0W 48)	Base-Catalysed and Organometallic Chemistry: Theory and Laboratory Skills (HV0X 48)	Chemical Engineering: Principles (HV03 47)	Engineering Mathematics 1 (HP48 46)	Engineering Mathematics 2 (HP49 47)	Engineering Mathematics 3 (HT1M 47)	Fluid Mechanics: Theory and Laboratory Skills (HV0A 47)	Fundamental Chemistry: Theory and Laboratory Skills (HV00 47)	Heat Transfer Theory and Practical Skills (HV09 47)	Industrial Chemicals: Processes and Products (HV0D 47)	Inorganic Chemistry: Theory and Laboratory Skills (HV0K 47)	Instrumental Techniques 1 (HV10 48)	Organic Chemistry: Theory and Laboratory Skills (HV0L 47)	Phase Equilibrium and Surface Chemistry (HV14 48)	Physical Chemistry: Theory and Laboratory Skills (HV0M 47)	Process Operations: Distillation (HV06 48)	Process Operations: Heat Exchange, Drying and Evaporation (HV07 48)	Process Safety Engineering (HV0C 47)	Thermodynamics and Kinetics: Theory and Laboratory Skills (HV15 48)
	Handover in Processing Industries Operations																		
Working Effectively in a Team in Processing Industries Operations							X		X							X			
Emergency Procedure in Processing Industries Operations																		X	
Control Room Operations in Processing Industries Operations																X			
Prepare for Complex Processing Operation in Processing Industries Operations																			
Control, Maintain and Restore Complex Processing Operation in Processing Industries Operations									X							X			
Complete a Complex Processing Operation in Processing Industries Operations							X		X							X			
Contribute to the Maintenance of Product Quality in Processing Industries Operations															X				

SQA Advanced Certificate and Diploma

National Occupational Standard	Aromatic Chemistry: Theory and Laboratory Skills (HV0W 48)	Base-Catalysed and Organometallic Chemistry: Theory and Laboratory Skills (HV0X 48)	Chemical Engineering: Principles (HV03 47)	Engineering Mathematics 1 (HP48 46)	Engineering Mathematics 2 (HP49 47)	Engineering Mathematics 3 (HT1M 47)	Fluid Mechanics: Theory and Laboratory Skills (HV0A 47)	Fundamental Chemistry: Theory and Laboratory Skills (HV00 47)	Heat Transfer Theory and Practical Skills (HV09 47)	Industrial Chemicals: Processes and Products (HV0D 47)	Inorganic Chemistry: Theory and Laboratory Skills (HV0K 47)	Instrumental Techniques 1 (HV10 48)	Organic Chemistry: Theory and Laboratory Skills (HV0L 47)	Phase Equilibrium and Surface Chemistry (HV14 48)	Physical Chemistry: Theory and Laboratory Skills (HV0M 47)	Process Operations: Distillation (HV06 48)	Process Operations: Heat Exchange, Drying and Evaporation (HV07 48)	Process Safety Engineering (HV0C 47)	Thermodynamics and Kinetics: Theory and Laboratory Skills (HV15 48)
Clean and Prepare Complex Items of Plant & Equipment for Production in Processing Industries Operations																			
Ensure Your Own Actions aim to Protect the Environment in Processing Industries Operations								X	X							X			
Control Emergencies and Critical Situations in Processing Industries Operations																			
Allocate Personnel to Maintain Processing in Processing Industries Operations																			
Plan to Maintain Product Integrity in Processing Industries Operations																			
Enable Individual Learning Through Coaching in Processing Industries Operations																			
Solving Process Problems in Processing Industries Operations			X				X	X	X							X	X		
Conduct an Assessment of Risks in the Workplace in Processing Industries Operations																			

SQA Advanced Certificate and Diploma

National Occupational Standard	Aromatic Chemistry: Theory and Laboratory Skills (HV0W 48)	Base-Catalysed and Organometallic Chemistry: Theory and Laboratory Skills (HV0X 48)	Chemical Engineering: Principles (HV03 47)	Engineering Mathematics 1 (HP48 46)	Engineering Mathematics 2 (HP49 47)	Engineering Mathematics 3 (HT1M 47)	Fluid Mechanics: Theory and Laboratory Skills (HV0A 47)	Fundamental Chemistry: Theory and Laboratory Skills (HV00 47)	Heat Transfer Theory and Practical Skills (HV09 47)	Industrial Chemicals: Processes and Products (HV0D 47)	Inorganic Chemistry: Theory and Laboratory Skills (HV0K 47)	Instrumental Techniques 1 (HV10 48)	Organic Chemistry: Theory and Laboratory Skills (HV0L 47)	Phase Equilibrium and Surface Chemistry (HV14 48)	Physical Chemistry: Theory and Laboratory Skills (HV0M 47)	Process Operations: Distillation (HV06 48)	Process Operations: Heat Exchange, Drying and Evaporation (HV07 48)	Process Safety Engineering (HV0C 47)	Thermodynamics and Kinetics: Theory and Laboratory Skills (HV15 48)
Identify Improvement to Energy Efficiency in Processing Industries Operations			X						X							X			
Enable Learning Through Demonstrations and Instruction in Processing Industries Operations																			

5.3 Mapping of Core Skills development opportunities across the qualifications

Unit code	Unit title	Communication		Numeracy		ICT		Problem Solving			Working with Others	
		Written	Oral	Using Number	Using Graphical Information	Accessing Information	Providing/Creating Information	Critical Thinking	Planning and Organising	Reviewing and Evaluating	Working Co-operatively with Others	Reviewing Co-operative Contribution
HV00 47	Fundamental Chemistry: Theory and Laboratory Skills	O		F	O	O	S	O	O	S	O	O
HV0L 47	Organic Chemistry: Theory and Laboratory Skills	O		O	O	O	S	O	O	S	O	O
HV0M 47	Physical Chemistry: Theory and Laboratory Skills	O		F	O	O	S	O	O	S	O	O
HP48 46	Engineering Mathematics 1			F	O			O	O	O		
HV0R 47	Chemical Process Technology: Graded Unit 1	S	S	S	S	S	S	F	F	F	O	O
HV03 47	Chemical Engineering: Principles			F	O			S	O	O		
HV0W 48	Aromatic Chemistry: Theory and Laboratory Skills	O		O	O	O	S	O	O	S	O	O
HV0T 48	Chemical Process Technology: Graded Unit 2	S	S	S	S	S	S	F	F	F	O	O
HV07 48	Process Operations: Heat Exchange, Drying and Evaporation			S	S			S	O	O		
HV0A 47	Fluid Mechanics: Theory and Laboratory Skills			F	S			S	O			
HV10 48	Instrumental Techniques 1	O		S	O	O	S	F	F	F	O	O
HV0D 47	Industrial Chemicals: Processes and Products	S	S			S	S	S	S			

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Unit code	Unit title	Communication		Numeracy		ICT		Problem Solving			Working with Others	
		Written	Oral	Using Number	Using Graphical Information	Accessing Information	Providing/Creating Information	Critical Thinking	Planning and Organising	Reviewing and Evaluating	Working Co-operatively with Others	Reviewing Co-operative Contribution
HV0C 47	Process Safety Engineering	S	S			S	S	S	S			
HV06 48	Process Operations: Distillation	S		E	S	O	O	S	O	O	S	O
HV15 48	Thermodynamics and Kinetics: Theory and Laboratory Skills	O		E	O	O	S	O	O	S	O	O
HV09 47	Heat Transfer Theory and Practical Skills	S		E	S	O	O	E	O	O	S	O
HV14 48	Phase Equilibrium and Surface Chemistry	O	O	E	E	O	O	E	O	O	O	O
HV0X 48	Base-Catalysed and Organometallic Chemistry: Theory and Laboratory Skills	O		O	O	O	S	O	O	S	O	O
HV0K 47	Inorganic Chemistry: Theory and Laboratory Skills	O		E	O	O	S	O	O	S	O	O
HP49 47	Engineering Mathematics 2			E	O			O	O	O		
HV11 48	Instrumental Techniques 2			O	O	O	O	O	O	O		
HV12 48	Main Group Inorganic Chemistry	O		S	O	O	S	O	O	S	O	O
HV0Y 48	Electrochemistry	S	S	O	O	O	O	S	S	S	O	O
HV13 48	Organic Stereochemistry: Theory and Laboratory Skills	O		O	O	O	S	O	O	S	O	O
HV0N 47	Physics Principles: Heat and Thermodynamics	O		E	O	O	S	O	O	S	O	O

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Unit code	Unit title	Communication		Numeracy		ICT		Problem Solving			Working with Others	
		Written	Oral	Using Number	Using Graphical Information	Accessing Information	Providing/Creating Information	Critical Thinking	Planning and Organising	Reviewing and Evaluating	Working Co-operatively with Others	Reviewing Co-operative Contribution
HV02 47	Fermentation Engineering			E	O			S	O	O		
HV0E 47	Process Water and Steam Services	S		E	S	O	O	S	O	S	O	O
HV01 47	Chemical Engineering: Applied Physical Chemistry			E	S			S	O	O		
HR3L 47	CAD: 2D I				S		O	O	O	O		
HV0P 47	Physics Principles: Mechanics	O		E	O	O	O	E	O	O		
HV0H 47	Quality and Health & Safety Systems in Science Industries	S	S			O	O	O	O		S	S
HV0G 46	Fundamental Chemistry: An Introduction	O		E	O	O	O	S	S	S	O	O
HV16 48	Transition Metal Chemistry: Theory and Laboratory Skills	O		S	O	O	S	O	O	S	O	O
HV0V 48	Environmental Sampling and Analysis	O		O	O	O	O	S	S	S	S	S
HV05 47	Industrial Biotechnology: Processing	S	S	S	S	O	S	S	O	O		
HV0J 47	Laboratory Skills for Science Industries	O	O	S	E	O	S	E	O	S	O	O
HT1M 47	Engineering Mathematics 3			E	O			O	O	O		
HT03 48	Engineering Mathematics 4			E	O			O	O	O		
HT1N 48	Engineering Mathematics 5			E	O			O	O	O		

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Unit code	Unit title	Communication		Numeracy		ICT		Problem Solving			Working with Others	
		Written	Oral	Using Number	Using Graphical Information	Accessing Information	Providing/Creating Information	Critical Thinking	Planning and Organising	Reviewing and Evaluating	Working Co-operatively with Others	Reviewing Co-operative Contribution
HP6L 47	Information Technology: Applications Software 1					E	E	O	O	O		
HR1G 47	ESOL for Work: Advanced Operational	S	S					O	O	O		
HR0M 47	Work Role Effectiveness	O	O	O	O	O	O	O	O	O	O	O
HR0P 48	Work Role Effectiveness	O	O	O	O	O	O	O	O	O	O	O
HP6M 47	Personal Development Planning	O	O			O	O	O	O	O		
HR1C 46	Workplace Communication in English	E	E			S	S	S	S	S	S	S

Key:

E = Embedded

S = Signposted

O = Opportunities

5.4 Assessment Strategy for the qualifications

In the majority of Units, theory based Outcomes are assessed holistically by means of an end of Unit closed-book assessment under controlled conditions. Practical Outcomes are evidenced by a variety of means; please consult individual specifications for clarification and details of arrangements. The Units in the following table are notable exceptions.

Unit	Assessment
Laboratory Skills for Science Industries	<p>Outcome 1: Production of Control of Substances Hazardous to Health (COSHH) and risk assessments.</p> <p>Outcome 2: Practical activities and laboratory diaries/pro formas.</p> <p>Outcome 3: Evidence of presenting and analysing scientific information.</p> <p>Outcome 4: Production of laboratory reports/poster/oral presentation.</p>
Chemical Process Technology: Graded Unit 1	Assessed by the use of a scientific report. The investigation brief should provide the learner with the opportunity to produce evidence that demonstrates she/he has met the aims of the Group Award.
Personal Development Planning	Assessed holistically by means of a personal development portfolio.
Chemical Process Technology: Graded Unit 2	Assessed by undertaking a laboratory-based project/work-based project and producing an associated scientific report. The investigation brief should provide the learner with the opportunity to produce evidence that demonstrates she/he has met the aims of the Group Award.
Quality and Health & Safety Systems in Science Industries	<p>Outcome 1: Assessment on key aspects of health and safety procedures in relation to science.</p> <p>Outcome 2: Assignment on an industrial quality system.</p> <p>Outcome 3: Industrial visit and associated report on quality and health and safety systems.</p>
Work Role Effectiveness	Evidence for the Unit will include self-appraisal materials generated by the learner. This will be confirmed or amended by employer comment (or report) and assessed in a professional interview by the assessor for this Unit.

Unit	Assessment
Workplace Communication in English	<p>Outcome 1: Summarising and evaluating a written business text which combines factual content and analysis.</p> <p>Outcome 2: Producing a folio of at least three vocationally relevant documents which present and examine information and ideas.</p> <p>Outcome 3: Taking part in sustained spoken communication which has a clear remit involving a complex vocational issue.</p>

6 Guidance on approaches to delivery and assessment

6.1 Sequencing/integration of Units

The structure of the SQA Advanced Certificate and SQA Advanced Diploma in Chemical Process Technology allows a high degree of flexibility in the mode of delivery. The Group Awards can be offered on a full-time, part-time, day-release, block release basis, or as an evening mode of study. A distance learning delivery mode is possible provided adequate materials, tutorial support, assessment facilities and laboratory time exist. Centres should note however that assessed practical activities must take place under supervised conditions. Combination of delivery modes is also a possibility. Such combined modes of study may enable learners to complete the Group Awards in a shorter time period.

Centres will define which order the Units are undertaken based on learner recruitment patterns, mode of delivery, resource implications, and logical progression dictated by topic and content.

The Group Awards lend themselves to a wide range of delivery mechanisms including formal teaching, case studies, group work, tutorial, laboratory/practical work, field work and demonstration/coaching opportunities. A number of Units specifically indicate some of these approaches are to be utilised in assessment therefore it is important that learners have experienced them throughout the learning process.

The inclusion of SCQF level 6 Units in chemistry and mathematics within the SQA Advanced Certificate/SQA Advanced Diploma in Chemical Process Technology framework provides an opportunity to support learners who have limited prior knowledge of either of these subjects. The opportunity to undertake these Units should be sequenced at an early stage of delivery.

While optional, the *Laboratory Skills for Science Industries* Unit could be integrated and evidence generated for this Unit from other Units throughout the Group Awards. It is important to note that the *Laboratory Skills for Science Industries* Unit has been designed so as to give learners the laboratory time necessary to develop essential practical skills, prior to assessment of set practical activities.

SQA Advanced Certificate and Diploma

It is expected that the *Chemical Process Technology: Graded Unit 1* would be undertaken in the first year of the (full-time) programme, and should use knowledge gained in the mandatory Units of the Group Award.

It is expected that the *Chemical Process Technology: Graded Unit 2* would be undertaken in the second year of the (full-time) programme and should use knowledge gained in the mandatory Units of the Group Award. Learners should have attained a high level of practical skills and experience before undertaking this Unit.

6.1.1 Delivery Schedule

There are many driving forces which determine a full-time delivery programme for any Group Award including accommodation, staff availability, materials and equipment.

The following table indicates a suggested delivery programme of Units over a two-year full-time delivery programme operating on a two block delivery system.

It is envisaged the SQA Advanced Certificate would be similar to the SQA Advanced Diploma Year 1 programme and therefore the suggested delivery model is the same. It is envisaged that the optional Units in the Year 1 programme are core Units from the SQA Advanced Diploma in order for learners to progress to the SQA Advanced Diploma Year 2 programme.

SQA Advanced Diploma in Chemical Process Technology	
Suggested delivery for a full-time two-year programme	
Year 1: Teaching Block 1	Year 1: Teaching Block 2
Engineering Mathematics 1 or 2	Organic Chemistry: Theory and Laboratory Skills
Heat Transfer Theory and Practical Skills	Physical Chemistry: Theory and Laboratory Skills
Fundamental Chemistry: Theory and Laboratory Skills	Chemical Process Technology: Graded Unit 1
Chemical Engineering: Principles	Process Safety Engineering
Optional Unit (could be Fundamental Chemistry: An Introduction)	Fluid Mechanics: Theory and Laboratory Skills
Optional Unit (could be Industrial Chemicals: Processes and Products)	Optional Units x 3 (could be: Inorganic Chemistry: Theory and Laboratory Skills; Instrumental Techniques 1; Engineering Mathematics 2 or 3)
Year 2: Teaching Block 1	Year 2: Teaching Block 2
Aromatic Chemistry: Theory and Laboratory Skills	Base Catalysed and Organometallic Chemistry: Theory and Laboratory Skills
Thermodynamics and Kinetics: Theory and Laboratory Skills	Process Operations: Heat Exchange, Drying and Evaporation
Process Operations: Distillation	Chemical Process Technology: Graded Unit 2
Phase Equilibrium and Surface Chemistry	
Optional Units x 7	

6.2 Recognition of Prior Learning

SQA recognises that learners gain knowledge and skills acquired through formal, non-formal and informal learning contexts.

In some instances, a full Group Award may be achieved through the recognition of prior learning. However, it is unlikely that a learner would have the appropriate prior learning and experience to meet all the requirements of a full Group Award.

The recognition of prior learning may **not** be used as a method of assessing in the following types of Units and assessments:

- ◆ SQA Advanced Graded Units
- ◆ Course and/or external assessments
- ◆ Other integrative assessment Units (which may or not be graded)
- ◆ Certain types of assessment instruments where the standard may be compromised by not using the same assessment method outlined in the Unit
- ◆ Where there is an existing requirement for a licence to practice
- ◆ Where there are specific health and safety requirements
- ◆ Where there are regulatory, professional or other statutory requirements
- ◆ Where otherwise specified in an Assessment Strategy

More information and guidance on the *Recognition of Prior Learning* (RPL) may be found on our website www.sqa.org.uk.

The following sub-sections outline how existing SQA Unit(s) may contribute to this Group Award. Additionally, they also outline how this Group Award may be recognised for professional and articulation purposes.

6.2.1 Articulation and/or progression

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

6.2.2 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.

6.3 Opportunities for e-assessment

E-assessment may be appropriate for some assessments in the Units comprising this Group Award. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at www.sqa.org.uk/e-assessment.

6.4 Support materials

A list of existing ASPs is available to view on SQA's website.

6.5 Resource requirements

Delivering centres will require appropriate science and chemical engineering teaching laboratories and technical support. Centres will require appropriate laboratory resources to support the delivery of the practical elements of these Group Awards.

Centres will require to ensure that specific requirements in terms of documents, texts, and IT resources to support the learning processes within Units are met.

All staff delivering these Group Awards will require to hold a qualification appropriate to the Unit delivered.

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 these qualifications 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* www.sqa.org.uk/GuideToAssessment.

8 Glossary of terms

Embedded Core Skills: Where the assessment evidence for the Unit also includes full evidence for complete Core Skill or Core Skill components. A learner successfully completing the Unit will be automatically certificated for the Core Skill. (This depends on the Unit having been successfully audited and validated for Core Skills certification.)

Finish date: The end of a Group Award's lapsing period is known as the finish date. After the finish date, the Group Award will no longer be live and the following applies:

- ◆ learners may not be entered for the Group Award
- ◆ the Group Award will continue to exist only as an archive record on SQA Connect

Graded Unit: Graded Units assess learners' 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 learners to retain and adapt their skills and knowledge.

Lapsing date: When a Group Award is entered into its lapsing period, the following will apply:

- ◆ the Group Award will be deleted from the relevant catalogue
- ◆ the Group Award specification will remain until the qualification reaches its finish date at which point it will be removed from SQA's website and archived
- ◆ no new centres may be approved to offer the Group Award
- ◆ centres should only enter learners whom they expect to complete the Group Award during the defined lapsing period

SQA credit value: The credit value allocated to a Unit gives an indication of the contribution the Unit makes to an SQA Group Award. An SQA credit value of 1 given to an SQA Unit represents approximately 40 hours of programmed learning, teaching and assessment.

SCQF: The Scottish Credit and Qualification Framework (SCQF) provides the national common framework for describing all relevant programmes of learning and qualifications in Scotland. SCQF terminology is used 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: SCQF credit points provide a means of describing and comparing the amount of learning that is required to complete a qualification at a given level of the Framework. One National Unit credit is equivalent to 6 SCQF credit points. One National Unit credit at Advanced Higher and one SQA Credit (irrespective of level) is equivalent to 8 SCQF credit points.

SCQF levels: The level a qualification is assigned within the framework is an indication of how hard it is to achieve. The SCQF covers 12 levels of learning. SQA Advanced Certificates and SQA Advanced Diplomas are available at SCQF levels 7 and 8 respectively. SQA Advanced Units will normally be at levels 6–9 and Graded Units will be at level 7 and 8. National Qualification Group Awards are available at SCQF levels 2–6 and will normally be made up of National Units which are available from SCQF levels 2–7.

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

Signposted Core Skills: refers to opportunities to develop Core Skills arise in learning and teaching but are not automatically certificated.

History of changes

It is anticipated that changes will take place during the life of the qualification and this section will record these changes. Centres are advised to check SQA Connect to confirm they are using the up to date qualification structure.

NOTE: Where a Unit is revised by another Unit:

- ◆ No new centres may be approved to offer the Unit which has been revised.
- ◆ Centres should only enter learners for the Unit which has been revised where they are expected to complete the Unit before its finish date.

Version number	Description	Date

Acknowledgement

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of SQA Advanced Qualifications.

FURTHER INFORMATION: Call SQA's Customer Contact Centre on 44 (0) 141 500 5030 or 0345 279 1000. Alternatively, complete our [Centre Feedback Form](#).

9 General information for learners

This section will help you decide whether this is the qualification for you by explaining what the qualification is about, what you should know or be able to do before you start, what you will need to do during the qualification and opportunities for further learning and employment.

The SQA Advanced Certificate and SQA Advanced Diploma in Chemical Process Technology are vocational qualifications which provide the knowledge and skills required for progression into further study and employment in the chemical sector.

The aims of the SQA Advanced Certificate and SQA Advanced Diploma in Chemical Process Technology are designed to:

- ◆ prepare you for an appropriate level of employment, in areas of the chemical sector such as laboratories, chemicals production, pharmaceutical, food and agriculture production and environmental science
- ◆ develop a range of contemporary vocational skills relating to the use, support and development of systems appropriate to employment at technician or professional level
- ◆ provide you with a range of skills to support learning in relevant SVQ 3/4 level programmes
- ◆ provide you with an element of vocational specialisation in a variety of areas such as laboratory work, chemical production, agriculture, energy and environmental science
- ◆ prepare you for progression to further studies in process engineering, chemical engineering and related disciplines
- ◆ provide a flexible route to the Group Award, allowing access to those in employment through part-time study and full-time provision
- ◆ provide you with an opportunity to discover which areas of chemical process are of most interest to you by allowing you experience of each of the main branches of the subject area which is diverse and varied
- ◆ develop study and research skills
- ◆ develop Core Skills such as working with others in a team environment and communication

9.1 Course Content

In order to achieve the SQA Advanced Certificate in Chemical Process Technology, you must achieve 12 credits as follows:

Section	Credits required	Notes
Mandatory Units	6 credits must be achieved	
Mandatory Units	2 credits must be achieved	A further 1 credit could be achieved from this section
Mandatory Units	1 credit must be achieved	A further 1 credit could be achieved from this section
Optional Sections A and B	1–3 credits must be achieved, depending on the choice of Units in the mandatory sections	

SQA Advanced Certificate and Diploma

In order to achieve the SQA Advanced Diploma in Chemical Process Technology, you must achieve 30 credits as follows:

Section	Credits required	Notes
Mandatory Units	20 credits must be achieved	
Mandatory Units	2 credits must be achieved	A further 1 credit could be achieved from this section
Optional Sections A and B	7–8 credits must be achieved, depending on the choice of Units in the mandatory sections	Maximum of 4 credits from optional section B

It is recommended that all learners be given a copy of the Group Award structures from Section 2 with clarification and explanation as appropriate. You should liaise with your lecturer to ensure that you complete the necessary Units to achieve the Group Award itself but also that progression routes remain open to you.

Assessment methods will be varied throughout the course and will include closed-book assessments, projects, reports and practical assignments. There may be presentations and case studies for some assessments. To pass a practical Outcome you will be expected to perform a range of laboratory experiments to a required standard, and to produce a report/pro forma on the experiment.

The SQA Advanced Certificate includes one Graded Unit. This is a project which you will select the topic for, plan, develop and then evaluate the work you have carried out. The topic selected will be related to your studies. The SQA Advanced Diploma has a second Graded Unit. This Graded Unit will be a practical or design based project. It may be carried out in your place of study or if you are employed in a relevant job you may carry out a work-based project. The topic again will be related to your studies.

The purpose of the Graded Units is to assess your ability to integrate and apply the knowledge and skills that you will have gained during your period of study. On successful completion of each Graded Unit you will be awarded a Grade of A, B or C. This grading applies only to the relevant Graded Unit and not the overall Group Award.

The SQA Advanced Certificate and SQA Advanced Diploma will develop Core Skills in *Numeracy, ICT, Working with Others* and *Problem Solving*. Some Units will give automatic certification for Core Skills, while others will give you the opportunity to develop these skills.

Completion of the SQA Advanced Certificate/SQA Advanced Diploma will give a qualification that has been designed for the Chemical Process Technology industry and will give you the skills and knowledge suitable for employment in the sector.