Arrangements for:

NPA in Software Development

at SCQF level 4

Group Award Code: G9HL 44

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Version: 01

Acknowledgement

History of changes

It is anticipated that changes will take place during the life of the qualification, and this section will record these changes. This document is the latest version and incorporates the changes summarised below.

Version number	Description	Date	Authorised by

Contents

1   Introduction

This is the Arrangements Document for the new National Progression Award (NPA) in Software Development at SCQF level 4 which was validated in June 2009. This document includes: background information on the development of the Group Award, its aims, guidance on access, details of the Group Award structure, and guidance on delivery.

The National Progression Award (NPA) in Software Development is a new award consisting of two Units at SCQF level 4 and one Unit at SCQF level 5.

Candidates will gain fundamental knowledge required to design, develop and test software applications.

2   Rationale for the development of the Group Award

The rationale for developing the National Progression Award (NPA) Software Development at SCQF level 4 is to address a demand for provision of an entry-level qualification, especially one that may be gained through short-course provision or flexible provision.

As from session 2007/2008 NPAs replaced Scottish Progression Awards (SPA). During the development of the new Group Awards to replace the Scottish Group Award (SGA) Computing and Information Technology, it was identified that there was scope to create a series of NPAs from the newly developed frameworks. Awareness was also raised that there was a growing requirement for NPAs due to the need to increase:

◆   candidate achievement at NC level
◆   the range of short qualifications, particularly for employees
◆   part-time and evening class numbers
◆   progression routes for school pupils

Three new Group Awards replaced the SGA in Computing and IT:

G8JM 44   *Digital Media Computing level 4*
G8JK 45   *Digital Media Computing level 5*
G90L 46   *Digital Media Computing level 6*

Embedding NPA qualifications within the NC Digital Media Computing, will give candidates the opportunity to gain several formal qualifications whilst undertaking the NC. This will be advantageous when a candidate has a particular interest and ability in specific areas covered by the NPAs.

The NPAs provide candidates with building blocks to give them more opportunities to achieve enough credits to progress to further levels of study and also to help to identify the areas in which they are strongest. Breaking the awards down into smaller qualifications may help some candidates to realise more achievable goals. This can help to develop a more positive attitude to learning.

There are currently seven NPAs which have derived from these National Certificates:

- NPA Digital Literacy at SCQF level 3
- NPA PC Passport: Beginner at SCQF level 4, Intermediate at SCQF level 5, Advanced at SCQF level 6
- NPA Internet Technology at SCQF levels 4 and 5
- NPA Web Design Fundamentals at SCQF level 5

To date the interest in, uptake and achievement rates in respect of this type of award are proving to be encouraging. This award is designed to complement the existing NPAs.

Software Development encompasses the designing, developing and testing of software applications. Software applications include traditional applications, web development/e-commerce and portal applications as well as database applications.

Although this is a technical discipline, any candidate who wishes to progress into information technology, computing, interactive media/web development or even animation would find software development beneficial. Designers should also have awareness in this area due to the programming capabilities of the design software applications used to build interactive media products.

The rationale for the development of this NPA (National Progression Award) in Software Development is to address the demand for provision of an entry qualification in programming fundamentals and software development.

The qualification focuses on planning and developing practical skills in software development through the use of a high level language. Successful candidates should be able to solve problems and implement short computer programs in a high level language.

This award is suitable for a wide range of candidates including secondary school pupils, full-time and part-time FE students. It will be beneficial to candidates in employment as well as those wishing to acquire skills to enter or re-enter the workplace.

The award is composed of existing Units which form part of the National Certificate (NC) in Digital Media Computing awards. Candidates undertaking the NC in Digital Media Computing awards have the opportunity to be certificated for this National Progression Award depending on their choice of Units within their programme of study. Conversely, candidates who achieve the National Progression Award will have acquired a number of SCQF credits that can count towards the National Certificate in Digital Media Computing awards or progression into other areas.

Aspects of the qualification also address demands from industry and government for the promotion of 'employability skills'. Successful candidates should be expected to have an appreciation of important employability skills such as collaboration, communicating with a client, problem solving and reflective practice, as well as being able to produce small working programs.

Market research was carried out which resulted in 161 staff from secondary schools, colleges and training providers and 18 employers from Scotland participating in a survey. Both the education survey and the employer survey showed strong support for the development of NPA Software Development at SCQF level 4 and indicated that there is a demand for such a qualification at this level.

The individual Units that make up the National Progression Award in Software Development at SCQF level 4 have been matched against the National Occupational Standards in IT Professional published by the sector skills council, e-skills, and have been shown to meet a significant range of the fundamental criteria of those standards.

3 Aims of the Group Award

This award is new for the sector and does not replace any existing awards. The award will provide an opportunity for centres to offer a certificated course based around a grouping of Units relating to Software Development at SCQF level 4.

The general aim of this award is to produce a robust qualification that allows candidates to enter vocational education, and centres to provide candidates with a solid grounding in software development.

3.1 Principal aims

- To develop candidates' understanding of the principles of software development, software development languages and environments, high level language constructs and standard algorithms.
- To provide candidates with entry level skills using a high level programming language.
- To provide candidates with access to industry-standard software and principles.
- To develop candidates' Core Skills in problem solving in relation to software development.
- To develop candidates' analytical and other transferable skills.
- To provide candidates with the opportunity to develop NOS employment skills in software development design and component creation.
- To provide candidates with the opportunity to develop NOS employment skills in Managing Work and Working with Others.

3.2 Other aims

- To provide candidates with the foundations to progress to higher level studies in computing, multimedia, interactive media, animation and related subjects through short-course provision.
- To allow candidates to build their knowledge and skills by undertaking a series of National Progression awards similar or to progress to a selection of different National Certificate awards, particularly within the Digital Media Computing suite, Higher National Certificates and Diplomas.
- To provide candidates with a solid grounding to enter vocational education.
- To provide candidates with the specialist skills required to access career opportunities in current and future markets.

3.3 Target groups

♦ School pupils involved in the Curriculum for Excellence.
♦ S3 and S4 schools pupils who will undertake the qualification as part of the school's vocational education programme. This is seen as the primary target market for the qualification. For such candidates the NPA provides a good basis for progression on to any of the suite NPAs at levels 5 and 6.
♦ S5 and S6 school pupils who will undertake the qualification as a broadening of the curriculum.
♦ Candidates who will be undertaking the NPA within full or part-time college programmes. This is seen as the other primary target market for the qualification.
♦ Trainees of national programmes which prepare for entry to the workforce, such as Get Ready for Work or Training for Work.
♦ Existing employees within the IT sector, who wish to develop competence in certain areas. These candidates are likely to undertake individual Units and not the full Group Award.

3.4 Employment opportunities

The majority of candidates undertaking this award are looking to improve their skills in computing and information technology, using it as a stepping stone for progression and articulation to the next level.

Many centres will use this award to address the needs of trainees on national programmes such at Get Ready for Work or Training for Work.

4 Access to Group Award

Access to this award will be at the discretion of the centre. However, it would be beneficial if candidates possessed basic IT skills. This may be evidenced by possession of either D01D 09 *Information Technology* (Access 3), Standard Grade *Computing Studies* at General level, or equivalent.

5 Group Award structure

All Units are within the National Certificate in Digital Media Computing.

5.1 Framework

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Computing: Programming in a High-level Language – Fundamentals	F1K0 10	6	4	1
Software Development	DF2Y 11	6	5	1
Problem Solving	F3DG 10	6	4	1

Note: All Units are mandatory within the award.

5.2 Mapping information

The Units have been written so as to be fully compatible with the relevant National Occupational Standards in Develop Software.

ESK p68 Software Development – Component Creation
ESK p73 Software Development – Design

Unit mapping to e-skills National Occupational Standards (NOS)

The two Units F1K0 10 *Computing: Programming in a High-level Language – Fundamentals* and DF2Y 11 *Software Development of the NPA Software Development* have been mapped to the:

E-skills NOS for Area of Competence (AOC) – Develop Software

'Software development commences with an agreed requirements definition and covers the creation of software designs/specifications, creation of the actual software components and finally installation and testing of the software'.

http://nos.e-skills.com/browse_html?show=nos

A tick ✓ states where an element <u>or</u> elements of the NOS map to one of the Units of the NPA Software Development. It is not a statement that the whole Unit maps to the NOS unit.

Unit mapping to e-skills, IT Professionals – Areas of Competency (AOC) Develop Software

E-skills NOS	Mandatory Units	
Units	F1K0 10	DF2Y 11
ESK (page 68) Software Development – component creation	✓	✓
ESK (page 73) Software Development – design	✓	✓

Unit mapping to Skillset Areas of Competency (AOC) in Personal Skills

The following supporting units are amongst several that have been identified by Skillset as most directly relevant to the Interactive Media sector. All the Units of the NPA Software Development provide candidates with the opportunity to develop skills in each of these AOCs:

Manage Your Work
- MSC A1   Manage your own resources
- SFE H1   Improve your time management and delegation skills
- ESK 18   Develop personal and organisational effectiveness

Working with Others
- SKS DMI14   Liaise with team members to assist the production process
- ESK 33   Interpersonal and written communication
- MSC E5   Ensure your own actions reduce risks to health and safety

Make Effective Use Of IT
- SFE F2   Communicate using IT
- SFE F3   Choose and use computers and software
- SKS DMI3   Contribute to the production of designs using IT

Keep Your Skills Up To Date
- MSC A2   Manage your own resources and professional development
- SFE A3   Check your own skills
- MSC A3   Develop your personal networks

5.3   Articulation, professional recognition and credit transfer

There are opportunities to articulate onto any of the following:

- NPA in Computer Systems and Networks SCQF level 5
- NPA in Website Enterprise SCQF level 5
- NPA in Digital Media Animation SCQF level 5
- NPA in Computers and Digital Photography SCQF level 5
- PC Passport SCQF level 5
- PC Passport SCQF level 6
- NPA in Digital Media Production SCQF level 6
- full/part-time courses at SCQF levels 5, 6, 7 and 8 in a wide range of subject areas

There is no professional recognition mapped to this award.

There is currently no credit mapping for the Units within this award.

6   Approaches to delivery and assessment

The National Progression Award in Software Development at SCQF level 4 has been created to match the requirements of candidates in the competences required to solve a problem using programming fundamentals in a high level language.

Sequencing of delivery and assessment is at the discretion of the centre, however it is recommended that the Unit *Computing: Programming in a High-level Language – Fundamentals* be delivered first. This would give the candidates an introduction to computer programming concepts. The Unit *Software Development* is a natural progression from the first one. They complement each other and each address a different component of the NPA. *Problem Solving* could be delivered at the same time as *Computing: Programming in a High-level Language – Fundamentals*. Candidates will require access to appropriate computer hardware and a software development environment throughout the NPA.

No particular hardware or software would be required to deliver this award.

An integrative approach to assessment is recommended for the NPA Software Development. The individual Units that comprise the NPA lend themselves to easy integration of assessment.

The assessment for Outcomes 1 and 2 of the Unit *Computing: Programming in a High-level Language – Fundamentals* should take the form of an objective test. This assessment would be suitable for delivery through e-assessment. The assessment for Outcome 1 of the Unit *Software Development* should take the form of a closed-book objective test and would also be suitable for delivery through e-assessment.

A single integrated assessment in the form of a practical task can be used to assess *Problem Solving,* Outcomes 3 and 4 of the Unit *Computing: Programming in a High-level Language – Fundamentals* and Outcome 2 of the Unit *Software Development*.

7   General information for centres

Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. 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 National Progression Award in Software Development SCQF level 4 is suitable for a wide range of candidates with basic computing ability who wish to develop the fundamental knowledge and skills required to solve problems by developing computer programs in a high level language. The Units that comprise this National Progression Award are a subset of the Units in the National Certificate in Digital Media Computing suite of awards at SCQF levels 4 and 5.

There are three Units within this award. In order to achieve the award you must successfully complete each of the Units.

The Units of study are:

♦ *Computing: Programming in a High-level language – Fundamentals*
♦ *Software Development*
♦ *Problem Solving*

During the award you will learn all about the basic programming concepts and how to write short programs using a software development language and environment. After the basics are covered you will develop further programming skills and eventually the knowledge and understanding required to devise a solution to a problem in software development.

Emphasis is placed on the importance of planning, documenting and testing the programs that you will implement. This NPA involves mainly practical activities. One of these practical skills involves learning how to use a software development environment to write and test computer programs. Other practical skills involve learning and applying a high level computer programming language.

The assessments for this award are a combination of practical work and theory. The practical assessment will take the form of a software development project where you will be required to devise a solution to a given problem by planning, designing, implementing and testing a computer program. Additionally you will be required to review and evaluate your success at tackling the problem. Two theory assessments will take the form of objective tests.

With the increasing availability of e-learning materials, it is highly likely that some of the delivery of these awards will be presented in an online format.

The knowledge and skills that you will acquire during the NPA Software Development are ones currently required by employers.

A successful candidate will have gained the knowledge and skills suitable to complement the study of other National Progression awards similar to this award or to progress to a selection of different National Certificates awards, particularly the Digital Media Computing suite, or Higher National Certificate and Diploma awards.

9 Glossary of terms

SCQF: This stands for the Scottish Credit and Qualification Framework, which is a new 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 SCQF credit point equates to 10 hours of learning. NQ Units at SCQF levels 2–6 are worth 6 SCQF credit points, NQ Units at level 7 are worth 8 SCQF points.

SCQF levels: The SCQF covers 12 levels of learning. 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.

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 lie outwith automatic certification.

Qualification Design Team: The QDT works in conjunction with a Qualification Manager/Development Manager to steer the development of the National Certificate/National Progression Award 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 National Certificates/National Progression Awards are those developments or revisions undertaken by a group of centres in partnership with SQA.