Mathematics (National 4)

Draft National Course Specification

Valid from August 2013

This edition: April 2011, draft version 1.0

Please refer to the note of changes at the end of this Course Specification for details of changes from previous version (where applicable).

Contents

Course outline

Course title: Mathematics (National 4)

SCQF: level 4 (24 SCQF credit points)

Course code: to be advised

Mandatory Units

Mathematics: Expressions and Formulae (National 4) **6 SCQF credit points**

Mathematics: Relationships (National 4) **6 SCQF credit points**

Numeracy (National 4) **6 SCQF credit points**

Added Value Unit
Mathematics (National 4) **6 SCQF credit points**

This Course includes six SCQF credit points for the assessment of added value in the Added Value Unit. Further information on this Unit is provided in the Assessment section.

Recommended entry

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

- Mathematics (Access 3) Course or relevant component Units

In terms of prior learning and experience, relevant experiences and outcomes may also provide an appropriate basis for doing this Course. Further information on relevant experiences and outcomes will be given in the *Course Support Notes*.

Progression

This Course or its components may provide progression to:

- Mathematics (National 5)
- further study, employment or training

Further details are provided in the Rationale section.

Equality and inclusion

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

Rationale

All new and revised National Courses reflect Curriculum for Excellence values, purposes and principles. They offer flexibility, provide more time for learning, more focus on skills and applying learning, and scope for personalisation and choice.

In this Course, and its component Units, there will be an emphasis on skills development and the application of those skills. Assessment approaches will be proportionate, fit for purpose and will promote best practice, enabling learners to achieve the highest standards they can.

This Course provides learners with opportunities to continue to acquire and develop the attributes and capabilities of the four capacities as well as skills for learning, skills for life and skills for work.

All Courses provide opportunities for learners to develop breadth, challenge and application, but the focus and balance of the assessment will be appropriate for the subject area.

Relationship between the Course and Curriculum for Excellence values, purposes and principles

Mathematics is important in everyday life, allowing us to make sense of the world around us and to manage our lives. Using mathematics enables us to model real-life situations and make connections and informed predictions. It equips us with the skills we need to interpret and analyse information, simplify and solve problems, assess risk, and make informed decisions.

Because mathematics is rich and stimulating, it engages and fascinates learners of all ages, interests and abilities. Learning mathematics develops logical reasoning, analysis, problem-solving skills, creativity, and the ability to think in abstract ways. It uses a universal language of numbers and symbols, which allows us to communicate ideas in a concise, unambiguous and rigorous way.

Mathematics equips us with many of the skills required for life, learning and work. Understanding the part that mathematics plays in almost all aspects of life is crucial. This reinforces the need for mathematics to play an integral part in lifelong learning and be appreciated for the richness it brings.

This Mathematics Course allows learners to acquire and develop the attributes and capabilities of the four capacities. For example: success in mathematical learning and activity leads to increased confidence as an individual; being able to think logically helps towards being a responsible citizen; and being able to understand, use and communicate mathematical ideas will help in becoming an effective contributor.

Purpose and aims of the Course

The Course, which includes the freestanding Unit in Numeracy at SCQF level 4, will motivate and challenge learners by enabling them to select and apply mathematical techniques in a variety of mathematical and real-life situations. The Course develops confidence in the subject and a positive attitude towards further study in mathematics. It uses numerical data and abstract terms and develops the idea of generalisation. The Course allows learners to interpret, communicate and manage information in mathematical form, skills which are vital to scientific and technological research and development.

This Course is designed to develop the learner's skills in using mathematical language, to explore mathematical ideas, and to develop skills relevant to learning, life and work in an engaging and enjoyable way. It will build on prior learning and develop:

- operational skills in algebra, geometry, trigonometry and statistics
- reasoning skills of investigation, problem solving, analysis and modelling
- numeracy skills in number processes and information handling

Information about typical learners who might do the Course

The Course would be suitable for all learners who have experienced breadth and depth of learning across Third level mathematics experiences and outcomes, or who have attained Access 3 Mathematics, or who have equivalent mathematical experience.

On successful completion of this Course, the learner could progress to:

- Mathematics (National 5)
- Lifeskills Mathematics (National 5)
- Numeracy at SCQF level 5 (freestanding Unit)
- National Certificate Group Awards
- employment

Mathematics has applications in many subject areas, and skills developed in this Course support progression in other curriculum areas, as well as in Skills for Work and National Progression Awards.

Course structure and conditions of award

Course structure

This Course will develop skills for further learning, as well as skills for life and work.

Learners will acquire and apply operational skills necessary for developing mathematical ideas through symbolic representation and diagrams. They will select and apply mathematical techniques and will develop their understanding of the interdependencies within mathematics. Learners will develop mathematical reasoning skills and will gain experience in making informed decisions. The Course includes the freestanding Unit in Numeracy at SCQF level 4.

Units are statements of standards for assessment and not programmes of learning and teaching. They can be delivered in a number of ways.

The Course has four Units, totalling 24 SCQF credit points.

Mathematics: Expressions and Formulae (National 4)
In this Unit, learners will develop the knowledge and skills, appropriate to this level, that involve the representation of ideas in symbolic form and the straightforward manipulation of abstract terms. This will include simplification of expressions and evaluation of formulae covering aspects of algebra and geometry. Learners will apply operational and reasoning skills in contexts, including those taken from life and work.

Mathematics: Relationships (National 4)
In this Unit, learners will develop knowledge and skills, appropriate to this level, which involve relationships in mathematics. Learners will work with straightforward relationships in algebra, geometry, trigonometry and statistics. They will develop their skills in solving equations, analysing graphs, making reasoned deductions and predictions. Learners will apply operational and reasoning skills in contexts, including those taken from life and work.

Numeracy (National 4)
This Unit will allow learners to develop numerical skills in number processes and information handling in order to solve problems and to make informed decisions. These skills will be developed in contexts including those of money, time and measurement.

Mathematics: Added Value Unit (National 4)
This Unit develops mathematical skills acquired from across the other three Units of the Course for use in more challenging problems, to enable the learner to apply them in unfamiliar situations and sometimes integrated ways. Learners will also be required to demonstrate breadth of learning across the Units. As an aid to meeting these aims, skills in using a calculator will be developed, and a calculator will be permitted to be used in part of the assessment strategy.

Conditions of award

To achieve the Mathematics (National 4) Course, learners must pass all of the required Units, including the Added Value Unit. The required Units are shown in the Course outline section.

National 4 Courses are not graded.

Skills and knowledge

Full skills and knowledge for the Course will be given in the *Course Assessment Specification*. A broad overview of the mandatory subject skills, knowledge and understanding that will be assessed in the Course is given in this section.

This Course will build on prior learning to develop straightforward:

Operational skills:

- algebraic — working with patterns, expressions, equations and graphs
- geometric — using properties of shapes, calculating angles and lengths
- trigonometric — using trigonometric ratios and relationships
- statistical — calculation of statistics, presenting information, assessing risk

Numeracy skills:

- number processes — working with number and number operations to solve real-life problems in contexts including money, time and measurement
- information handling — making informed decisions based on data and ideas of chance and uncertainty in contexts including money, time and measurement

Reasoning skills:

- investigative — researching and extracting information
- problem solving — formulating an approach to reach a conclusion
- analytical — interpreting information and using logic
- modelling — applying a suitable mathematical model

The Added Value Unit of the Course develops these mathematical skills for use in more challenging problems, to enable the learner to apply them in unfamiliar situations and sometimes integrated ways. Learners will also be required to demonstrate breadth of learning from across the Units. As an aid to meeting these aims, skills in using a calculator will be developed.

Assessment

Information about assessment for the Course will be included in the *Course Assessment Specification*, which will provide full details including advice on how a learner's overall attainment for the Course will be determined.

Unit assessment

All Units are internally assessed against the requirements shown in the Unit Specification.

They can be assessed on a Unit-by-Unit basis or by combined assessment.

They will be assessed on a pass/fail basis within centres. SQA will provide rigorous external quality assurance, including external verification, to ensure assessment judgements are consistent and meet national standards.

The assessment of the Units in this Course will be as follows:

Mathematics: Expressions and Formulae (National 4)
Learners who complete the Unit will be able to:

- use mathematical reasoning skills related to straightforward expressions and formulae
- use mathematical operational skills related to straightforward expressions and formulae

Mathematics: Relationships (National 4)
Learners who complete the Unit will be able to:

- use mathematical reasoning skills related to straightforward relationships
- use mathematical operational skills related to straightforward relationships

Numeracy (National 4)
Learners who complete the Unit will be able to:

- use numerical processes to solve given, straightforward real-life problems involving money, time and measurement
- interpret data and ideas of chance and uncertainty to solve given, straightforward real-life problems involving money, time and measurement

Added Value Unit

Courses from National 4 to Advanced Higher include assessment of added value[1]. At National 4, added value will be assessed in an Added Value Unit. The Added Value Unit will address the key purposes and aims of the Course as defined in the Course Rationale. It will do this by addressing one or more of breadth, challenge or application.

In this Course, the Added Value Unit will focus on breadth and challenge.

[1] Definitions can be found here: www.sqa.org.uk/sqa/45528.html

The learner will draw on and extend the skills they have learned across the other three Units. This will be assessed through a test[2], which will offer opportunities to demonstrate the breadth of knowledge and skills acquired from across the Course in unfamiliar situations and sometimes integrated ways. As an aid to meeting these aims, skills in using a calculator will be developed and a calculator will be permitted to be used in part of the assessment strategy.

Exemplification of possible assessment approaches for Units will be provided in the *National Assessment Resource*.

[2] Definitions can be found here: www.sqa.org.uk/sqa/45528.html

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

(Note: The information given below reflects the initial thinking on significant opportunities for development of skills for learning, skills for life and skills for work. These may be subject to change as the development process progresses.)

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

2 Numeracy
2.1 Number processes
2.2 Money, time and measurement
2.3 Information handling

5 Thinking skills
5.3 Applying
5.4 Analysing and evaluating

Amplification of these skills is given in SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work*. The level of these skills will be appropriate to the level of the Course. Further information on building in skills for learning, skills for life and skills for work for the Course is given in the *Course Support Notes*.

Administrative information

Published: April 2011 (version 1.0)

Superclass: to be advised

History of changes to National Course Specification

Course details	Version	Description of change	Authorised by	Date

Note: You are advised to check SQA's website (www.sqa.org.uk) to ensure you are using the most up-to-date version of the Course Specification.