



Higher  
Course  
Specification



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# Higher Mathematics Course Specification

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

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## Course outline

**Course title:** Higher Mathematics

**SCQF:** level 6 (24 SCQF credit points)

**Course code:** to be advised

### Mandatory Units

<b>Mathematics: Expressions and Functions (Higher)</b>	<b>6 SCQF credit points</b>
<b>Mathematics: Relationships and Calculus (Higher)</b>	<b>6 SCQF credit points</b>
<b>Mathematics: Applications (Higher)</b>	<b>6 SCQF credit points</b>

**Course assessment** **6 SCQF credit points**

This Course includes six SCQF credit points to allow additional time for preparation for Course assessment. The Course assessment covers the added value of the Course. Further information on the Course assessment 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, knowledge and understanding required by the following or equivalent qualifications and/or experience:

- ◆ National 5 Mathematics Course or relevant component Units

### Progression

This Course or its Units may provide progression to:

- ◆ other qualifications in Mathematics or related areas
- ◆ further study, employment and/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*.

## **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 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 rich and stimulating. It engages and fascinates learners of all ages, interests and abilities. Learning in 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 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 assist in becoming an effective contributor.

## **Purpose and aims of the Course**

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.

The Course aims to:

- ◆ motivate and challenge learners by enabling them to select and apply mathematical techniques in a variety of mathematical situations
- ◆ develop confidence in the subject and a positive attitude towards further study in mathematics and the use of mathematics in employment
- ◆ deliver in-depth study of mathematical concepts and the ways in which mathematics describes our world
- ◆ allow learners to interpret, communicate and manage information in mathematical form; skills which are vital to scientific and technological research and development
- ◆ deepen the learner's skills in using mathematical language and exploring advanced mathematical ideas

### **Information about typical learners who might do the Course**

This Course is suitable for learners who are secure in their attainment of the National 5 Mathematics Course or an equivalent qualification.

Learners will develop skills in selecting and applying mathematical techniques in a variety of mathematical situations. These skills will enable progression to further learning and to employment. Learners will experience in-depth study of the ways in which mathematics describes our world, and become skilled in interpreting, analysing, communicating and managing information in mathematical form.

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

- ◆ Advanced Higher Mathematics
- ◆ Advanced Higher Applied Mathematics (Statistics)
- ◆ Advanced Higher Applied Mathematics (Mechanics)

Mathematics has applications in many other subject areas, and skills developed in this Course can support progression in other curriculum areas and employment.

# Course structure and conditions of award

## Course structure

This Course will develop, deepen and extend the mathematical skills necessary at this level and beyond.

Learners will acquire and apply operational skills necessary for exploring mathematical ideas through symbolic representation and diagrams. In addition, learners will develop mathematical reasoning skills and will gain experience in making informed decisions.

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

Units may be delivered in parallel or in sequence. For further advice on delivery, please refer to the *Course Support Notes*.

### **Mathematics: Expressions and Functions (Higher)**

The general aim of this Unit is to develop knowledge and skills that involve the manipulation of expressions, the use of vectors and the study of mathematical functions. The Outcomes cover aspects of algebra, geometry and trigonometry, and also skills in mathematical reasoning and modelling.

### **Mathematics: Relationships and Calculus (Higher)**

The general aim of this Unit is to develop knowledge and skills that involve solving equations and to introduce both differential calculus and integral calculus. The Outcomes cover aspects of algebra, trigonometry, calculus, and also skills in mathematical reasoning and modelling.

### **Mathematics: Applications (Higher)**

The general aim of this Unit is to develop knowledge and skills that involve geometric applications, applications of sequences and applications of calculus. The Outcomes cover aspects of algebra, geometry, calculus, and also skills in mathematical reasoning and modelling.

## Conditions of award

To gain the award of the Course, the learner must pass all of the Units as well as the Course assessment. The required Units are shown in the Course outline section. Course assessment will provide the basis for grading attainment in the Course award.

## Skills, knowledge and understanding

Further information on the assessment of the skills, knowledge and understanding for the Course is 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 develop learners' ability to:

- ◆ understand and use a range of complex mathematical concepts and relationships
- ◆ select and apply operational skills in algebra, geometry, trigonometry, calculus and statistics within mathematical contexts
- ◆ select and apply skills in numeracy
- ◆ use mathematical reasoning skills to extract and interpret information and to use complex mathematical models
- ◆ use mathematical reasoning skills to think logically, provide justification or proof and solve problems
- ◆ communicate mathematical information with complex features

Skills, knowledge and understanding to be included in the Course will be appropriate to the SCQF level of the Course. The SCQF level descriptors give further information on characteristics and expected performance at each SCQF level ([www.sqa.org.uk/scqf](http://www.sqa.org.uk/scqf)).

## Assessment

Information about assessment for the Course is included in the *Course Assessment Specification*, which provides 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 judgments are consistent and meet national standards.

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

#### **Mathematics: Expressions and Functions (Higher)**

Learners who complete the Unit will be able to:

- ◆ use mathematical operational skills linked to expressions and functions
- ◆ use mathematical reasoning skills linked to expressions and functions

#### **Mathematics: Relationships and Calculus (Higher)**

Learners who complete the Unit will be able to:

- ◆ use mathematical operational skills linked to relationships and calculus
- ◆ use mathematical reasoning skills linked to relationships and calculus

#### **Mathematics: Applications (Higher)**

Learners who complete the Unit will be able to:

- ◆ use mathematical operational skills linked to applications
- ◆ use mathematical reasoning skills linked to applications

Exemplification of possible assessment approaches for these Units is provided in the *National Assessment Resource*.

### Course assessment

Courses from National 4 to Advanced Higher include assessment of [added value](#)<sup>1</sup>. At National 5, Higher and Advanced Higher, the added value will be assessed in the Course assessment. The added value for the Course must 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.

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<sup>1</sup> Definitions can be found here: [www.sqa.org.uk/sqa/45528.html](http://www.sqa.org.uk/sqa/45528.html)

In the Higher Mathematics Course, added value will focus on:

- ◆ breadth
- ◆ challenge
- ◆ application

The learner will draw on and apply the skills they have learned during the Course. This will be assessed within a [question paper](#)<sup>2</sup>, requiring demonstration of the breadth of knowledge and skills acquired from across the Units of the Course, sometimes in integrated ways. As an aid to meeting these aims, skills in using a calculator will be developed and a calculator will be permitted in part of the question paper.

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

<sup>2</sup> See link above for definition.



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

It is expected that learners will develop broad, generic skills through this Course. The skills that learners will be expected to improve on and develop through the 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

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**Published:** April 2012 (version 1.0)

**Superclass:** to be advised

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## History of changes to National Course Specification

Course details	Version	Description of change	Authorised by	Date