National 5 Course Specification

National 5 Physics Course Specification (C757 75)

Valid from August 2013

First edition: April 2012
Revised: June 2013, version 1.1

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

Course outline

Course title: National 5 Physics

SCQF: level 5 (24 SCQF credit points)

Course code: C757 75

Mandatory Units

H256 75	**Physics: Electricity and Energy (National 5)**	**6 SCQF credit points**
H25A 75	**Physics: Waves and Radiation (National 5)**	**6 SCQF credit points**
H258 75	**Physics: Dynamics and Space (National 5)**	**6 SCQF credit points**

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 one or more of the following or by equivalent qualifications and/or experience:

- National 4 Physics or related component Units

There may also be progression from National 4 Chemistry, National 4 Biology, National 4 Environmental Science and National 4 Science Courses.

In terms of prior learning and experience, relevant experiences and outcomes may also provide an appropriate basis for doing this Course.

Progression

This Course or its Units may provide progression to:

- other qualifications in Physics 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 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

Through learning in physics, learners develop their interest in and understanding of the world. They engage in a wide range of investigative tasks, which allows them to develop important skills to become creative, inventive and enterprising, in a world where the skills and knowledge developed by physics are needed across all sectors of society.

Physics courses should encourage resourcefulness, which leads to becoming a confident individual. Successful learners in physics think creatively, analyse and solve problems. Physics can produce responsible citizens, through studying the impact it makes on their lives, on the environment, and on society.

The Course allows learners to understand and investigate the world in an engaging and enjoyable way. It develops learners' ability to think analytically, creatively and independently, and to make reasoned evaluations. The Course provides opportunities for learners to acquire and apply knowledge, to evaluate environmental and scientific issues, to consider risk, and to make informed decisions. This can lead to learners developing an informed and ethical view of complex issues. Learners will develop skills in communication, collaborative working and leadership, and apply critical thinking in new and unfamiliar contexts to solve problems.

Purpose and aims of the Course

The purpose of the Course is to develop learners' interest and enthusiasm for physics in a range of contexts. The skills of scientific inquiry and investigation are developed, throughout the Course, by investigating the applications of physics. This will enable learners to become scientifically literate citizens, able to review the science-based claims they will meet.

Physics gives learners an insight into the underlying nature of our world and its place in the universe. From the sources of the power we use, to the exploration of space, it covers a range of applications of the relationships that have been discovered through experiment and calculation, including those used in modern technology. An experimental and investigative approach is used to develop knowledge and understanding of physics concepts.

This Course will enable learners to develop a deeper understanding of physics concepts and the ability to describe and interpret physical phenomena using mathematical skills. They will develop scientific methods of research in which issues in physics are explored and conclusions drawn.

The aims of this Course are for learners to:

- develop and apply knowledge and understanding of physics
- develop an understanding of the role of physics in scientific issues and relevant applications of physics, including the impact these could make on society and the environment
- develop scientific inquiry and investigative skills
- develop scientific analytical thinking skills in a physics context
- develop the use of technology, equipment and materials, safely, in practical scientific activities
- develop planning skills
- develop problem solving skills in a physics context
- use and understand scientific literacy, in everyday contexts, to communicate ideas and issues and to make scientifically informed choices
- develop the knowledge and skills for more advanced learning in physics
- develop skills of independent working

The Course also serves to equip all learners with an understanding of the impact of physics on everyday life, and with the knowledge and skills to be able to evaluate media reports. This will also equip learners to make their own decisions on issues within a modern society where the body of scientific knowledge and its applications and implications are ever developing. By using the skills base and knowledge and understanding of physics, learners will become scientifically literate citizens.

Information about typical learners who might do the Course

The Course is suitable for learners who have experienced learning across the sciences experiences and outcomes. The Course may be suitable for those wishing to study physics for the first time.

This Course has a skills-based approach to learning. It takes account of the needs of all learners and provides sufficient flexibility to enable learners to achieve in different ways.

Physics Courses are offered from SCQF level 3 to SCQF level 7. Vertical progression is possible through these levels, while lateral progression is possible to other qualifications in the sciences. This Course can also assist entry to employment, training and further education.

Course structure and conditions of award

Course structure

The Course develops skills in a physics context. Learners will gain an understanding of physics, and develop this through a variety of approaches, including practical activities.

The Course has three mandatory Units, as listed below. These Units are designed to provide progression to the Units with similar titles at Higher.

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

Units can be taught sequentially or in parallel to each other. However, learning and teaching approaches should provide opportunities to integrate skills, where possible.

Physics: Electricity and Energy (National 5)
The general aim of this Unit is to develop skills of scientific inquiry, investigation and analytical thinking, along with knowledge and understanding of electricity and energy. Learners will apply these skills when considering the applications of electricity and energy on our lives, as well as the implications on society/the environment. This can be done by using a variety of approaches, including investigation and problem solving.

The Unit covers the key areas of energy transfer, heat and the gas laws. Learners will research issues, apply scientific skills and communicate information related to their findings, which will develop skills of scientific literacy.

Physics: Waves and Radiation (National 5)
The general aim of this Unit is to develop skills of scientific inquiry, investigation and analytical thinking, along with knowledge and understanding of waves and radiation. Learners will apply these skills when considering the applications of waves and radiation on our lives, as well as the implications on society/the environment. This can be done by using a variety of approaches, including investigation and problem solving.

The Unit covers the key areas of waves and nuclear radiation. Learners will research issues, apply scientific skills and communicate information related to their findings, which will develop skills of scientific literacy.

Physics: Dynamics and Space (National 5)
The general aim of this Unit is to develop skills of scientific inquiry, investigation and analytical thinking, along with knowledge and understanding of dynamics and space. Learners will apply these skills when considering the applications of dynamics and space on our lives, as well as the implications on society/the environment. This can be done by using a variety of approaches, including investigation and problem solving.

The Unit covers the key areas of kinematics, forces and space. Learners will research issues, apply scientific skills and communicate information related to their findings, which will develop skills of scientific literacy.

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 includes:

- demonstrating knowledge and understanding of physics by making statements, describing information, providing explanations and integrating knowledge
- applying knowledge of physics to new situations, interpreting information and solving problems
- planning, designing, and safely carrying out experiments/practical investigations to test given hypotheses or to illustrate particular effects
- selecting information and presenting information appropriately in a variety of forms
- processing information, using calculations and units where appropriate
- making predictions based on evidence/information
- drawing valid conclusions and giving explanations supported by evidence/justification
- identifying sources of uncertainty and suggesting improvements to experiments/practical investigations
- communicating findings/information

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).

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 an individual Unit basis or by using other approaches which combine the assessment for more than one Unit.

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.

Physics: Electricity and Energy (National 5)
Learners who complete this Unit will be able to:

- apply skills of scientific inquiry and draw on knowledge and understanding of the key areas of this Unit to carry out an experiment/practical investigation
- draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

Physics: Waves and Radiation (National 5)
Learners who complete this Unit will be able to:

- apply skills of scientific inquiry and draw on knowledge and understanding of the key areas of this Unit to carry out an experiment/practical investigation
- draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

Physics: Dynamics and Space (National 5)
Learners who complete this Unit will be able to:

- apply skills of scientific inquiry and draw on knowledge and understanding of the key areas of this Unit to carry out an experiment/practical investigation
- draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

Course assessment

Courses from National 4 to Advanced Higher include assessment of added value[1]. 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.

In the National 5 Physics Course, added value will focus on breadth, challenge and application.

Learners will draw on, extend and apply the skills they have learned during the Course. This will be assessed within a question paper[2] and an assignment[3], requiring demonstration of the breadth of skills, knowledge and understanding acquired from across the Units and how they can be applied in unfamiliar contexts and/or integrated ways.

[1] Definitions can be found here: http://www.sqa.org.uk/sqa/58409.html

[2] See link above for definition.

[3] 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

Published: June 2013 (version 1.1)

History of changes to National Course Specification

Course details	Version	Description of change	Authorised by	Date
	1.1	Skills, knowledge and understanding section: amendment to wording to clarify activities	Qualification Development Manager	June 2013