



# **Advanced Higher Design and Manufacture — draft Course rationale and summary**



This edition: March 2012, draft version 1.0

Published by the Scottish Qualifications Authority  
The Optima Building, 58 Robertson Street, Glasgow G2 8DQ  
Lowden, 24 Wester Shawfair, Dalkeith, Midlothian EH22 1FD

[www.sqa.org.uk](http://www.sqa.org.uk)

© Scottish Qualifications Authority 2012

# Contents

<b>Course rationale</b>	<b>1</b>
<b>Background</b>	<b>1</b>
Relationship between the Course and Curriculum for Excellence values, purposes and principles	1
Purpose and aims of the Course	2
Information about typical learners who might do the Course	3
<b>Course summary</b>	<b>4</b>
Course outline	4
<b>Course structure and conditions of award</b>	<b>5</b>
Course structure	5
Conditions of award	6
<b>Assessment</b>	<b>7</b>
Unit assessment	7
Course assessment	7

# Course rationale

## Background

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

The Advanced Higher Design and Manufacture Course allows learners to explore the multi-faceted world of design and manufacturing in an increasingly commercial and industrialised context.

The Course focuses on creativity and innovation in the contexts of design and manufacture. Learners will have opportunities to make good use of their skills and knowledge already acquired in numeracy and science when considering technical details and operational principles, and to draw on aspects of social subjects and RMPS when considering aspects of environmentalism and ethics as well as other areas of the curriculum, personal experiences and interests. It is in this overarching integrative quality that the Course demonstrates broad options, possibilities and flexibilities in supporting personal growth.

In the Course, learners are encouraged to exercise imagination, creativity, ethical awareness and logical thinking in realistic, contemporary, and where practical partnership situations.

The challenges and activities for learning in the Course encourage learners to become successful, responsible and creative in their use of design and manufacturing skills and technologies, and to continue to acquire and develop the attributes and capabilities of the four capacities, including: creativity, flexibility and adaptability; enthusiasm and a willingness to learn; perseverance, independence and resilience; responsibility and reliability; and confidence and enterprise. In addition a course of this nature should prepare learner to be able to understand the effects of design and manufacturing decisions and promote self-

awareness and responsibilities in environmental stewardship. Through these challenges and activities learners should find learning an enjoyable and engaging experience.

The Course provides progression from the Higher Design and Manufacture Course.

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

In both industry and society, the pace of change is increasing, and will continue to do so. New materials, processes and practices, as well as techniques and technology have had, and will continue to have a major impact on society, global economics, international partnerships, and the environment. Designers and manufacturing based organisations have a significant role in supporting the demands of society. Scotland has a strong and historical tradition in design and manufacturing and although the landscape has changed somewhat over the years, our strengths remain and our reputation grounded on innovation and quality. With a large number of manufacturers and designers contributing to Scotland's economy and providing employment, it is right that learners with an interest in working and contributing to these sectors are well prepared, enthusiastic, self-motivated and innovative. As Scotland continues to compete successfully in a global design and manufacturing market place and builds commercial partnerships across the world, it is important that it continues to build capacity and nurtures forward thinking, innovative, talented, and informed designers and manufacturers. Advanced Higher Design and Manufacture provides experiences which support these qualities.

The Course will support learners with a deep interest in designing and manufacturing, and those who are likely to progress to further studies or employment in the field. The Course provides a broad and practical experience in design and manufacturing and builds on the experience, knowledge and skills which learners will have acquired in the Higher Design and Manufacture Course, as well as utilising aspects of their broader education and experiences.

The Course stresses the integration of designing and manufacturing as a connected activity and that design is an iterative process. The Course highlights the close relationship between designing, making, modelling, testing, and refining and presenting design ideas.

The Course allows learners to consider the various factors that impact on a product's design. It will consider the life cycle of a product from its inception through design, manufacture, and use, and re-use and the impacts of disposal.

The aims of the Course are to enable learners to:

- ◆ foster understanding of the processes of designing in commercial and industrial contexts
- ◆ consider user experiences for designed and manufactured items
- ◆ develop and apply an understanding of the factors which influence design and manufacturing activities
- ◆ enhance knowledge of contemporary manufacturing processes
- ◆ develop a critical and visual awareness associated with requirements for user interface and product detailing

- ◆ develop independence in learning and enquiry skills in the context of designing and manufacturing
- ◆ develop economic, social and environmental awareness of the implications of design through an increased emphasis on commercial and industrial production

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

The Course is designed for all learners who can respond to a level of challenge including, but not limited to, those considering further study or a career in design and manufacturing-related disciplines. It provides sufficient breadth, flexibility and choice to meet the needs of all learners.

Learners will develop a deeper understanding of the broad roles and contributions of those working in a design and manufacturing environment to analyse, problem solve, present, innovate and create solutions to specific design and manufacturing needs and requirements.

Course activities also provide opportunities to enhance generic and transferable skills in planning and organising, working independently and in teams, critical thinking and decision making, research, communication and self- and peer-evaluation, in a design and manufacturing context. In addition, learners may make valuable learning contacts through design and manufacturing businesses.

This Course or its components may provide progression to:

- ◆ a range of design or manufacturing-related Higher National Diplomas (HNDs)
- ◆ degrees in product design or product design engineering and related disciplines
- ◆ careers in design, manufacturing, artisanal, technical, creative or artistic fields

# Course summary

**Course title: Advanced Higher Design and Manufacture**

**SCQF level 7 (32 SCQF credit points)**

## Course outline

### Mandatory Units

The Course comprises the following mandatory Units:

<b>Design and Manufacture Analysis (Advanced Higher)</b>	<b>8 SCQF credit points</b>
<b>Design and Manufacture Development (Advanced Higher)</b>	<b>8 SCQF credit points</b>
<b>Design and Manufacture Case Study (Advanced Higher)</b>	<b>8 SCQF credit points</b>

**Course assessment** **8 SCQF credit points**

This Course includes eight 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.

# Course structure and conditions of award

## Course structure

The Course enables learners to develop and extend a range of design and manufacture skills, including skills in product analysis, research, problem solving, graphic design, the use of equipment and materials, design software and skills in testing and evaluating.

The Course also enables learners to develop and extend knowledge and understanding of key design and manufacture concepts and processes, the ability to apply these to a variety of problems, and an awareness of the impact of design and manufacturing activities on society and the environment.

Skills are developed in design and manufacture as they apply in the contexts of commerce and industry.

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

The Course consists of three mandatory Units and Course assessment. The Course assessment will consist of a Question Paper and a Project.

### Mandatory Units

#### **Design and Manufacture Analysis (Advanced Higher)**

This Unit will require learners to carry out an analysis of the performance and production of a product or suitable item. Learners should consider the design and record its functional requirements, operation and use. Learners will consider the impact of the design in terms of environment, aesthetics, user interface, and economic and technical issues. Alongside this, learners will explore the materials, manufacturing techniques and assembly procedures.

#### **Design and Manufacture Development (Advanced Higher)**

This Unit allows learners to critically explore and consider aspects of a design or product, identify perceived improvements that might be made and hence create a design opportunity. Learners may consider a range of modifications including the various requirements of clients, users, manufacturers, environmental audits, market response, technical, technological and material science advances, competition, user interface, aesthetics, form and product detailing. In developing and presenting a proposal for improvement, learners will engage in research and development activities.

#### **Design and Manufacture Case Study (Advanced Higher)**

The case study allows learners to explore a product; a design or an item in terms of its development and evolution. Learners will identify the key and critical stages of developments and the influences which can evidence why design decisions were taken and the resulting changes. They may include influences such as sociological, scientific and technical knowledge, materials development, environmentalism, sustainability, economic constraints, or advances in manufacturing technologies. The Unit will require learners to demonstrate skills in

*successful learner, confident individual, responsible citizen, effective contributor*

research and enquiry, using evidence, and foresight in suggesting or hypothesising on future developments.

## **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.

Draft

# Assessment

Information about assessment standards 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.

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 and application.

In the Advanced Higher Design and Manufacture Course, added value will focus on:

- ◆ breadth
- ◆ challenge
- ◆ application

Learners will draw on, extend and apply the skills and knowledge they have developed during the Course. These will be assessed through a combination of a [project](#)<sup>2</sup> and a [question paper](#)<sup>3</sup>.

The Design and Manufacture project adds value by requiring challenge and application. Learners will apply knowledge and skills from the Units to solve an appropriately challenging design and manufacturing problem.

The question paper introduces breadth to the assessment. It requires depth of understanding and application of knowledge from across the Units.

---

<sup>1</sup> 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 definitions.

<sup>3</sup> See link above for definitions.