



National 5 Graphic Communication

Course code:	C835 75
Course assessment code:	X835 75
SCQF:	level 5 (24 SCQF credit points)
Valid from:	session 2017–18

The course specification provides detailed information about the course and course assessment to ensure consistent and transparent assessment year on year. It describes the structure of the course and the course assessment in terms of the skills, knowledge and understanding that are assessed.

This document is for teachers and lecturers and contains all the mandatory information you need to deliver the course.

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Course overview

The course consists of 24 SCQF credit points which includes time for preparation for course assessment. The notional length of time for a candidate to complete the course is 160 hours.

The course assessment has two components.

Component	Marks	Duration
Component 1: question paper	80	2 hours
Component 2: assignment	40	See course assessment section

Recommended entry	Progression
<p>Entry to this course is at the discretion of the centre.</p> <p>Candidates should have achieved the fourth curriculum level or the National 4 Graphic Communication course or equivalent qualifications and/or experience prior to starting this course.</p>	<ul style="list-style-type: none">◆ other qualifications in graphic communication or related areas◆ further study, employment and/or training

Conditions of award

The grade awarded is based on the total marks achieved across all course assessment components.

Course rationale

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.

Every course provides opportunities for candidates to develop breadth, challenge and application. The focus and balance of assessment is tailored to each subject area.

The National 5 Graphic Communication course provides progression mainly from the craft, design, engineering and graphics experiences and outcomes. Candidates broaden their skills in a creative environment and are encouraged to exercise imagination, creativity and logical thinking.

The course allows candidates to develop an awareness of graphic communication as an international language and an understanding of how graphic communication technologies impact on society and the environment.

Candidates initiate, develop and communicate ideas graphically, and develop spatial awareness and visual literacy through graphic experiences. They interpret graphic communications initiated by others, and use graphic communication equipment, software and materials effectively.

The course also provides opportunities to build self-confidence and enhance skills in numeracy, ICT, planning and organising work tasks, and in working independently and in collaboration with others. Candidates develop skills in critical thinking, decision-making and communication.

Purpose and aims

The course provides opportunities for candidates to gain skills in reading, interpreting and creating graphic communications. They also learn to apply knowledge and understanding of graphic communication standards, protocols and conventions.

The course is practical, exploratory and experiential in nature and combines elements of recognised professional standards for graphic communication, partnered with graphic design creativity and visual impact.

Candidates develop:

- ◆ skills in graphic communication techniques, including the use of equipment, graphics materials and software
- ◆ the ability to extend and apply knowledge and understanding of graphic communication standards, protocols and conventions
- ◆ an understanding of the impact of graphic communication technologies on our environment and society

Who is this course for?

This course is a broad-based qualification, suitable for learners with an interest in both digital and paper-based graphic communication. It is largely learner-centred, includes practical and experiential learning opportunities and is suitable for those wanting to progress onto higher levels of study or a related career.

Course content

The course develops skills in two main areas. Candidates are able to apply these skills to produce graphics that provide relevant visual impact and graphics that transmit information.

2D graphic communication

Candidates develop creativity and skills within a 2D graphic communication context. They initiate, develop and communicate ideas using graphic techniques in straightforward and familiar contexts, as well as in some less familiar or new contexts. Candidates also develop 2D graphic spatial awareness.

3D and pictorial graphic communication

Candidates develop creativity and skills within a 3D and pictorial graphic communication context. They initiate, develop and communicate ideas using graphic techniques in straightforward and familiar contexts, as well as in some less familiar or new contexts. Candidates also develop 3D graphic spatial awareness.

Skills, knowledge and understanding

Skills, knowledge and understanding for the course

The following provides a broad overview of the subject skills, knowledge and understanding developed in the course:

- ◆ replicating basic, familiar and some new graphic forms in 2D, 3D and pictorials
- ◆ initiating and producing simple preliminary, production and promotional graphics in straightforward, familiar and some new contexts
- ◆ initiating and producing simple informational graphics in straightforward, familiar and some new contexts
- ◆ visual literacy by interpreting simple but unfamiliar graphic communications
- ◆ spatial awareness in straightforward but unfamiliar 2D, 3D and pictorial graphic situations
- ◆ using standard graphic communication equipment, software and materials effectively for simple tasks with some complex features
- ◆ knowledge of graphic communication standards, protocols and conventions in straightforward but unfamiliar contexts
- ◆ applying design skills, including creativity, when developing solutions to simple graphics tasks with some complex features
- ◆ the ability to take initiative in evaluating work in progress and completed graphics and applying suggestions for improvement in presentation
- ◆ knowledge of a range of computer-aided graphics techniques and practices
- ◆ knowledge of colour, illustration and presentation techniques in straightforward, familiar and some unfamiliar contexts
- ◆ knowledge and understanding of the impact of graphic communication technologies on our environment and society

Skills, knowledge and understanding for the course assessment

The following provides details of skills, knowledge and understanding sampled in the course assessment:

Question paper		Assignment	
Graphic types	Knowledge and understanding of the role of preliminary, production and promotional graphics in graphic communication activities.	Graphic types	Skills in producing effective preliminary, production and promotional graphic communications.
Manual techniques	Knowledge and understanding of the role of manual and computer-aided techniques and processes and their comparative merits when producing effective and informative graphic communications and solutions.	Manual and/or computer-aided techniques	Skills in selecting and applying manual and/or computer-aided graphic techniques and processes, using graphic communication applications and a range of common graphic media, equipment and/or devices, to produce effective and informative graphic communications.

Question paper		Assignment
Computer-aided techniques	<p>Knowledge and understanding of the role of computer-aided techniques:</p> <ul style="list-style-type: none"> ◆ describing processes, stages and generic commands applied (or to be applied) in producing graphic solutions ◆ ranges, features and uses of graphic hardware and software and computer systems file management ◆ digital input and output devices and the advantages and limitations of computer-aided design (CAD) ◆ application of light source, surface texture and materials in both 2D CAD and 3D CAD illustrations 	

Question paper		Assignment	
Drawing standards, protocols and conventions	<p>Knowledge, understanding and identification of recognised drawing standards, protocols and conventions commonly used in engineering and construction:</p> <ul style="list-style-type: none"> ◆ line types: outline, projection, dimension, centre, hidden detail, cutting plane and fold ◆ dimensioning: linear, chain, parallel, radial, diameter, angular, square, across flats and across corners ◆ symbols and conventions ◆ conventions for sectioning and hatching ◆ symbols for building construction ◆ third-angle projection system and symbols ◆ building construction drawing: location plans, site plans, floor plans, sectional views, elevations and scales 	Applying drawing standards, protocols and conventions	<p>Skills in applying recognised drawing standards, protocols and conventions, while producing responses and/or solutions to a graphic communication problem or situation:</p> <ul style="list-style-type: none"> ◆ line types: outline, projection, dimension, centre, hidden detail, cutting plane and fold ◆ dimensioning: linear, chain, parallel, radial, diameter, angular, square, across flats and across corners ◆ symbols and conventions ◆ conventions for sectioning and hatching ◆ symbols for building construction ◆ third-angle projection system and symbols ◆ building construction drawing: location plans, site plans, floor plans, sectional views, elevations and scales

Question paper		Assignment	
Geometric shapes and forms and everyday objects	<p>Knowledge, understanding and skills in spatial awareness when interpreting geometric shapes and forms and/or those used in the communication of everyday objects:</p> <ul style="list-style-type: none"> ◆ common geometric forms and everyday objects consisting of squares, rectangles, circles, hexagons, octagons, right prisms, pyramids, cones and cylinders ◆ partial or single cuts to these forms ◆ components based on geometric forms ◆ combinations of two components 	Geometric shapes and forms and everyday objects	<p>Skills in producing graphics representing everyday objects, based upon geometric shapes and forms in supporting the production of graphic communications:</p> <ul style="list-style-type: none"> ◆ common geometric forms and everyday objects consisting of squares, rectangles, circles, hexagons, octagons, right prisms, pyramids, cones and cylinders ◆ partial or single cuts to these forms ◆ components based on geometric forms ◆ combinations of two components

Question paper		Assignment	
Views and techniques	<p>Knowledge and understanding of the role, benefits and use of a variety of views and techniques in 2D, 3D and pictorial formats, in communicating geometric shapes and forms and everyday objects:</p> <ul style="list-style-type: none"> ◆ orthographic projection of geometric forms and everyday objects in third-angle projection ◆ true lengths and true shapes ◆ surface developments, sectional views, assembly drawings and exploded isometric views ◆ pictorial views: one- and two-point perspective, isometric, oblique and planometric 	Views and techniques	<p>Skills in the appropriate selection and use of 2D, 3D and pictorial views and techniques, to produce graphic communications:</p> <ul style="list-style-type: none"> ◆ orthographic projection of geometric forms and everyday objects in third-angle projection ◆ true lengths and true shapes ◆ surface developments, sectional views, assembly drawings and exploded isometric views (minimum of three parts) ◆ pictorial views: one- and two-point perspective, isometric (including curves), oblique (including curves) and planometric

Question paper		Assignment	
Layout elements and principles, colour theory and informational graphics	<p>Knowledge and understanding of the types of promotional graphics, informational graphics (including graphs and charts) and their associated roles.</p> <p>Interpretation and identification of creative techniques used for effective promotional graphics:</p> <ul style="list-style-type: none"> ◆ alignment, dominance, unity, depth, contrast, line, the use of colour (warm, cool, contrast, harmony, advancing, receding, mood, tints, shades, primary, secondary and tertiary), reflection and shade ◆ using a range of manual and electronic techniques in promotional graphics 	Creativity in producing effective promotional documents	<p>Skills in applying creative and effective techniques to generate ideas and to produce effective promotional graphic responses to a graphic communication problem or situation:</p> <ul style="list-style-type: none"> ◆ using design elements and principles: alignment, dominance, unity, depth, contrast, line, the use of colour (warm, cool, contrast, harmony, advancing, receding, mood, tints, shades, primary, secondary and tertiary), reflection and shade ◆ using a range of manual and electronic techniques in promotional documents

Question paper	Assignment	
	Techniques in sketching	<p>Skills in applying electronic and/or manual sketching techniques:</p> <ul style="list-style-type: none"> ◆ proportion, line quality, vanishing points, line sketching using related orthographic views and single- and two-point perspective ◆ representations of geometric forms and everyday objects in supporting the production of graphic communications
	Illustration techniques using manual and/or computer-aided formats	<p>Skills in using illustration techniques to create effective and informative graphic communications:</p> <ul style="list-style-type: none"> ◆ representations of light, shade, shadow, reflection, tone, gradient, material, texture and layout ◆ visual enhancement techniques in supporting the production of graphic communications

Question paper		Assignment
Computer-aided design	<p>Knowledge, understanding and interpretation of techniques and generic drawing and editing commands and terms:</p> <ul style="list-style-type: none"> ◆ 2D drawing tools: line, circle, ellipse, arc, rectangle, copy, zoom, mirror, trim, rotate, chamfer, fillet, pattern fill and scale ◆ import and export ◆ 3D modelling features: extrusion and revolve/revolved solids ◆ 3D modelling edits: shell, subtraction, fillet and chamfer ◆ assemblies (mate, align and centre axis) ◆ techniques in producing orthographic and pictorial views using CAD ◆ the use and function of CAD libraries 	

Question paper		Assignment	
Desktop publishing	<p>Knowledge, understanding and interpretation in explaining and justifying using desktop publishing (DTP) techniques and generic terms:</p> <ul style="list-style-type: none"> ◆ copy/cut/paste, text box, handles, colour fill, margin, single-page format, title, extended text, cropping, text wrap, flow text along a path, serif and sans serif font styles, bleed, transparency, drop shadow, rotate, justification, paper sizing, reverse, column, gutter, caption, header and footer, line, grid, snap to grid, guidelines and snap to guidelines ◆ the use and role of thumbnails and annotation 	Desktop publishing	<p>Skills in applying desktop publishing (DTP) techniques when planning and producing graphic layouts:</p> <ul style="list-style-type: none"> ◆ copy/cut/paste, text box, handles, colour fill, margin, single-page format, title, extended text, cropping, text wrap, flow text along a path, serif and sans serif font styles, bleed, transparency, drop shadow, rotate, justification, paper sizing, reverse, column, gutter, caption, header and footer, line, grid, snap to grid, guidelines and snap to guidelines ◆ thumbnails and annotation

Question paper		Assignment	
Graphic communication technology: impact on society and the environment	<p>Knowledge and understanding of the impact and influence of graphic communication technologies on society and the environment:</p> <ul style="list-style-type: none"> ◆ soy ink and wax ink ◆ 3D printing ◆ touchscreen devices ◆ the paperless office ◆ use of recycled materials ◆ CAD as it supports manufacturing and other industries ◆ DTP in marketing and promotional activities ◆ remote working ◆ communication crossing international boundaries 		
		Safe working	Using safe working practices and systems which support graphic communication activities in studios and other such working environments.

Skills, knowledge and understanding included in the course are 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.scqf.org.uk).

Skills for learning, skills for life and skills for work

This course helps candidates to develop broad, generic skills. These skills are based on [SQA's Skills Framework: Skills for Learning, Skills for Life and Skills for Work](#) and draw from the following main skills areas:

2 Numeracy

2.2 Money, time and measurement

4 Employability, enterprise and citizenship

4.2 Information and communication technology (ICT)

5 Thinking skills

5.2 Understanding

5.3 Applying

5.4 Analysing and evaluating

These skills must be built into the course where there are appropriate opportunities and the level should be appropriate to the level of the course.

Further information on building in skills for learning, skills for life and skills for work is given in the course support notes.

Course assessment

Course assessment is based on the information provided in this document.

The course assessment meets the key purposes and aims of the course by addressing:

- ◆ breadth — drawing on knowledge and skills from across the course
- ◆ challenge — requiring greater depth or extension of knowledge and/or skills
- ◆ application — requiring application of knowledge and/or skills in practical or theoretical contexts as appropriate

This enables candidates to apply:

- ◆ knowledge and understanding to describe and explain graphic communication techniques, methods and standards
- ◆ knowledge and understanding to interpret simple but unfamiliar graphic communications
- ◆ knowledge and understanding to provide and/or suggest solutions and/or recognised methodologies to limited and simple graphic problems or situations
- ◆ knowledge and skills to produce a solution to an appropriately challenging graphic communication problem

Course assessment structure: question paper

Question paper

80 marks

The question paper has one section and gives candidates the opportunity to demonstrate skills, knowledge and understanding relating to:

Area	Range of marks
Computer-aided design techniques	15–20
Graphic items in specific situations	8–10
Manual and electronic methods of graphic communication	6–14
Spatial awareness	12–17
Drawing standards, protocols and conventions	10–17
Use of colours, layout and presentation techniques	15–20

The question paper has 80 marks, which is 67% of the overall marks for the course assessment (120 marks).

A proportion of marks are available for more challenging questions, which generally require interpretation and/or integration of more complex graphic communications. This could be in the complexity of the expected response, the descriptions and/or justifications of more detailed and/or complex processes, or problem-solving.

Candidates may support their answers by sketching (if desired) to further illustrate and support their response, however, sketching is not a requirement. Candidates are not required to draw with instruments.

Questions allow for a variety of response types, including short/limited responses and extended responses.

Setting, conducting and marking the question paper

The question paper is set and marked by SQA and conducted in centres under conditions specified for external examinations by SQA.

Candidates complete the paper in 2 hours.

Specimen question papers for National 5 courses are published on SQA's website. These illustrate the standard, structure and requirements of the question papers candidates sit. The specimen papers also include marking instructions.

Course assessment structure: assignment

Assignment

40 marks

The assignment assesses the ability to apply graphic communication skills and knowledge developed and acquired during the course in the context of defined tasks, which require candidates to respond to a problem or situation.

It has three areas covering preliminary, production and promotional graphics. These may, or may not, be thematically related and include various tasks that candidates complete.

Marks are awarded for:

Area	Range of marks
Preliminary graphics	10–20
Production graphics	10–20
Promotional graphics	10–20

The assignment provides an opportunity for candidates to:

- ◆ demonstrate graphic design skills and creativity
- ◆ use graphic communication technologies
- ◆ produce preliminary, production and promotional graphic items in response to a situation or problem
- ◆ use illustration techniques to create graphics with relevant visual impact
- ◆ produce 2D and 3D production drawings, applying appropriate standards, protocols and conventions (drawing includes manual or electronic production methodologies)
- ◆ review and evaluate their progress, giving justification for the choice of graphic items and the graphic communication techniques employed

The assignment has 40 marks, which is 33% of the overall marks for the course assessment (120 marks).

Setting, conducting and marking the assignment

The assignment is:

- ◆ set by SQA, on an annual basis
- ◆ conducted under a high degree of supervision and control
- ◆ submitted to SQA for external marking

All marking is quality assured by SQA.

Assessment conditions

Time

The assignment is carried out over 8 hours, starting at an appropriate point in the course, once all content has been delivered.

Supervision, control and authentication

The assignment must be carried out:

- ◆ without interruption by periods of learning and teaching
- ◆ in a classroom environment
- ◆ on an individual basis by the candidate (ie no group work is permitted)
- ◆ in a supervised environment, to ensure that work presented is the candidate's own

Resources

This is a closed book assessment. Candidates cannot have access to learning and teaching materials, the internet, notes, exemplar materials, resources on classroom walls or anything similar.

Each assessment task includes instructions and details of any equipment or materials required.

Reasonable assistance

Candidates are required to progress through each stage of the assignment without any teacher intervention or guidance, having acquired the skills earlier in the course.

Once assignments are completed, they cannot be returned to candidates for further work.

Evidence to be gathered

Full details of evidence requirements, are contained within each assessment task.

All candidate evidence (whether created manually or electronically) must be submitted to SQA in paper-based format.

Volume

Candidates should present their work on a maximum of eight single-sided A3-sized pages.

The above is given to indicate the volume of evidence required. No penalty will be applied where candidates exceed this.

Grading

A candidate's overall grade is determined by their performance across the course assessment. The course assessment is graded A–D on the basis of the total mark for all course assessment components.

Grade description for C

For the award of grade C, candidates will typically have demonstrated successful performance in relation to the skills, knowledge and understanding for the course.

Grade description for A

For the award of grade A, candidates will typically have demonstrated a consistently high level of performance in relation to the skills, knowledge and understanding for the course.

Equality and inclusion

This course is designed to be as fair and as accessible as possible with no unnecessary barriers to learning or assessment.

For guidance on assessment arrangements for disabled candidates and/or those with additional support needs, please follow the link to the assessment arrangements web page: www.sqa.org.uk/assessmentarrangements.

Further information

The following reference documents provide useful information and background.

- ◆ [National 5 Graphic Communication subject page](#)
- ◆ [Assessment arrangements web page](#)
- ◆ [Building the Curriculum 3–5](#)
- ◆ [Design Principles for National Courses](#)
- ◆ [Guide to Assessment](#)
- ◆ [SCQF Framework and SCQF level descriptors](#)
- ◆ [SCQF Handbook](#)
- ◆ [SQA Skills Framework: Skills for Learning, Skills for Life and Skills for Work](#)
- ◆ [Coursework Authenticity: A Guide for Teachers and Lecturers](#)
- ◆ [Educational Research Reports](#)
- ◆ [SQA Guidelines on e-assessment for Schools](#)
- ◆ [SQA e-assessment web page](#)

Appendix 1: course support notes

Introduction

These support notes are not mandatory. They provide advice and guidance to teachers and lecturers on approaches to delivering the course. They should be read in conjunction with this course specification and the specimen question paper and coursework.

The course is delivered over 160 hours of class time (as indicated by its SCQF level and points). This includes 40 hours for induction, extending the range of learning and teaching approaches, support, consolidation, and integration of learning, together with preparation for course assessment and the course assessment itself.

Developing skills, knowledge and understanding

This section provides further advice and guidance about skills, knowledge and understanding that could be included in the course. Teachers and lecturers should refer to this course specification for the skills, knowledge and understanding for the course assessment. Course planners have considerable flexibility to select coherent contexts which will stimulate and challenge their candidates, offering both breadth and depth.

The 'approaches to learning and teaching' section provides suggested experiences and activities that teachers and lecturers can build into their delivery, to develop the skills, knowledge and understanding of the course.

Approaches to learning and teaching

National 5 Graphic Communication, like all National Courses, has been developed to reflect Curriculum for Excellence values, purposes and principles. The approach to learning and teaching developed by individual centres should reflect these principles.

Personalisation and choice should be taken into account when planning learning and teaching. With the greater availability and ease of using graphic communication technology and software applications, centres can fully utilise all available technology, unless otherwise specified (eg where references are made to computer-aided design).

Judgements need to be made regarding what strategies best support the acquisition of knowledge and skills, and the development of learning of graphic communication principles and practice. Spatial awareness, cognition and reasoning can be developed in a number of ways that supports the activity of graphic communication. Holding, rotating, disassembling, re-assembling, folding, photographing, predicting, formal drawing, and sketching are all useful techniques to build capacity and understanding.

References to 'sketching' and 'drawing' in the course encourages the use and experience of both electronic and/or manual methods, and candidates should be given as much flexibility, personalisation and choice as possible.

There are many approaches to communicating with graphics that use a range of media and electronic technology. Candidates should be given the opportunity to develop the appropriate knowledge and understanding which underpins successful graphic communication and visual literacy, and methods should be carefully selected to allow this.

Learning and teaching strategies

Teachers and lecturers are encouraged to use a range of learning and teaching strategies to enrich candidates' experiences, for example:

Co-operative and collaborative learning approaches support, encourage and enable all candidates to achieve their full potential. These approaches support thinking skills, develop confidence in working as part of a team, and help develop higher-order skills (such as analysis and problem-solving).

Graphic communication lends itself to **active learning** and teachers and lecturers will find it helpful to contextualise learning experiences to real-life situations, where appropriate. There are a number of project-based themes that support this method of learning, such as competition-based work, charity and community, enterprise and business, and environmental themes.

Problem-based learning (PBL) develops candidates' problem-solving, decision making, investigative skills, creative thinking, team working and evaluative skills. It prepares them for problem-based assessment activities and may be best used at the end of a topic. This ensures that candidates are secure in their knowledge and understanding, as it requires them to develop the ability to apply knowledge and skills in less familiar contexts.

For example, candidates could be asked to design a logo to promote an international sporting event, such as the Olympic or Commonwealth Games. The logo would need to be understood by people from many competing or visiting nations. Candidates would then apply their knowledge of sport, athletics, games, sporting equipment, international identity, languages and barriers, layout, colour, and textual information in addressing this task, before presenting a solution. This task could be undertaken individually or in a group.

Where it is helpful to simulate real-life situations, to share tasks and promote team working skills, group work approaches can be used within the delivery of the course. Group work **cannot** be used for the course assessment.

Contexts for learning

Teachers and lecturers should develop a programme of learning that supports graphic communication in the world of work, with activities from graphic industries. Most communities will have businesses or individuals with expertise who can contribute to the learning context, by providing useful information, acknowledging the skill sets required, creating sustainable links with the centre and fostering aspirations for employment and careers.

Where appropriate, teachers and lecturers could enrich the learning experience with guest speakers from industry, and educational visits and trips, eg companies specialising in printing, signage, engineering or packaging, a local newspaper production office,

construction sales office or retail outlets. These will support learning through contextualisation. Links with industry, colleges and universities will help candidates understand graphic communication in the context of the world of work, support their future progression and inform curriculum or career pathway decisions.

Learning about Scotland and Scottish culture could enrich the learning experience and help develop the skills for learning, skills for life and skills for work. Where there are opportunities to contextualise approaches to learning and teaching in Scottish contexts, teachers and lecturers should consider this.

Learning and teaching resources

ICT is an integral part of learning and teaching in graphic communication and where appropriate, resources such as interactive boards, tablets, scanners and visualisers should be encouraged. Interactive boards can improve the learning experience when delivering new learning, related to software packages (simply by making it easier to observe ideas, instruction and direction) and visualisers support the delivery of manual sketching and rendering, as well as tonal work with shadow and reflection using demonstrations and even physical items.

As technology evolves, learning and teaching approaches should naturally adapt to reflect their potential. Electronic technology could also be used effectively in capturing the candidates' journeys as they progress through the course. However, teachers and lecturers should ensure that, whatever method is used, candidates develop appropriate knowledge and understanding of the principles, where they apply.

As well as new technology, teachers and lecturers should make use of existing resources to complete graphics work and tasks, as these resources are used in graphic activities outwith the classroom environment. These resources could include drawing boards, pencils, markers, pastels, masks, inks and airbrush, vinyl, texture boards, templates, stencils, highlighting pens, compasses, light boxes, straight edges and squares.

Areas of study for candidates

2D orthographic drawing

Candidates should experience more than a single approach to creating 2D drawings. The principles of orthographic projection can be learned in a multitude of ways using a variety of learning and teaching resources and methods.

Graphical literacy and proficiency can be developed by using computers, tablets, digital pens, sketching, board work, paper and pencil, graphic instruments and equipment, block work, plotting and drawing. It is anticipated that when the principles of projection and spatial awareness are sufficient, candidates will learn to integrate these methods and personalise learning to match their own preferences.

Sketching

The development of skills in sketching will support many aspects of the course. It is a quick and effective means of recording, developing and communicating ideas graphically. As a

problem-solving and creative tool, analytical and developmental sketching skills are important. Where possible, sketching should be tackled freehand and some of the orthographic projection principles should be incorporated into freehand sketching work. The emphasis would be on using construction techniques and in establishing good proportion and line quality.

Sketching could involve the use of digital materials, applications, and devices as well as pencils, pens, templates or guides in completing the sketch. Candidates may wish to maintain a sketch book which records information and techniques for practice and reference. Teachers and lecturers should ensure that the content of the sketch book is accurate and, where applicable, adheres to recognised convention.

3D models and pictorial drawing and sketching

Candidates should experience more than a single approach to creating 3D models and pictorial work. Although it is likely that most teachers and lecturers will use pencil work as a starting point to build skills and techniques, this could be transferred to or replaced by electronic sketching where expertise, equipment and resources provide such opportunities.

Using paint-styled packages or applications (which allow the on-screen placement of lines and the ability to trim) would be worth considering. In such cases, constructional work might be done in different colours from outline work. In National 5 Graphic Communication, these should be everyday objects or geometrics with a degree of complexity, and likely to incorporate curves and simple sections. Applications such as Google SketchUp or 2D drawing/sketch apps such as Autodesk SketchBook Pro could help candidates understand the principles of sketching simple 3D objects in wireframe.

This could then be advanced to more realistic representations, using the range of solid and surface modelling software available. It is important that candidates can identify the steps required to construct models and the associated commands. Where computer-aided design has been used to generate certain aspects of the work, candidates should be able to demonstrate understanding of the principles of how and why views are generated. Reviewing and evaluating existing work alongside the related products will help candidates determine the effectiveness and role of these types of graphics, as they communicate the visual aspects or detail of the product.

Pictorial and 3D-colour illustrations

It is likely that when exploring the techniques and practices for conveying surface texture, tonal change and colour application, candidates will probably use prepared examples to allow them to see the effects of different techniques on the same object (for example, a simple rectilinear, straight-edged form and those with curves, voids and various parts, rendered for different textures). Candidates may attempt to predict the effects of lighting changes on the appearance of the objects and how well colour works in given situations.

Practicing with a small variety of media will build skills in rendering, and teachers and lecturers may wish to use pre-prepared representations for candidates to apply colour, tone and texture to. They could also use work already done by candidates through traces, or use software applications to render objects on-screen. In manual application, it is important that candidates develop skills in mixed media when rendering. In digital applications,

opportunities to photograph sketches and apply colour, shade and tone are available. Work in colour and contexts will support candidates when considering, creating and applying appropriate background for their 3D model objects. It is important that candidates can identify the steps required to render models and the associated commands.

Create simple pictorial or 3D promotional displays

Presenting the skills and knowledge around a theme or in short contained tasks can aid learning. This highlights the connections between graphic styles and techniques as they apply to a given situation or problem, and this might be approached in mini-brief format. Such approaches will gradually build proficiencies in thinking, designing and applying graphic knowledge and skills in context.

Promotional displays could take a variety of formats and can demonstrate that candidates have the necessary planning, skills and standards. This could be in paper or digital production or in the form of a simple card model, although it should be noted that wizards do not reflect candidates' capabilities and **must not** be used.

Themed or short self-contained project work

Presenting the skills and knowledge around a theme can aid learning by highlighting the connections between graphic styles and techniques via a single extended project. It could also prepare candidates for progression through subsequent graphic communication courses. Similarly, by presenting project work as a series of short, self-contained projects, candidates could be encouraged by shorter, more achievable goals. This approach allows teachers and lecturers to adapt and refresh project work to suit candidates.

E-learning

There are a number of online resources which may be familiar to most teachers and lecturers. These provide a range of step-by-step tutorials from relative novice to advanced user. These could be considered for classroom learning activities to support development of skills and understanding, and in accelerating the production of graphics. There are many online videos which demonstrate CAD/CAM in the packaging and graphics industries.

Sequence of teaching topic areas

There is no prescribed order to deliver the course topic areas. Resources and techniques will vary between centres and so it is likely that a preferred approach could emerge or that a centre might follow an existing, tested strategy.

Suggested activities for candidates

During the course, it is expected that candidates will develop the skills, knowledge and understanding required to complete the course assessments. Teachers and lecturers should ensure that the following activities are covered:

Produce and interpret 2D sketches and drawings by:

- ◆ producing well-proportioned orthographic sketches of very good line quality, of everyday objects and/or geometric forms

- ◆ producing orthographic drawings and details of everyday objects, buildings, structures and/or geometric shapes and forms to within an accuracy of 1 mm
- ◆ extracting information from given drawings to inform new drawing work
- ◆ identifying and applying appropriate drawing standards, protocols and conventions where these apply — including third angle projection, dimensioning, line types and the use of scale
- ◆ explaining basic computer-aided design commands, techniques and practice

Produce preliminary 2D colour designs and illustrations for single-page promotional displays by:

- ◆ illustrating 2D sketches or drawings of everyday objects to convey surface texture, tonal change and colour
- ◆ planning and justifying the choice of colours, layout and presentation techniques in promotional graphic displays
- ◆ explaining aspects of colour theory including:
 - primary, secondary and tertiary colours
 - tints and shades
 - warm and cool colours; advancing and receding
 - creating contrast, harmony and unity through the use of colour in promotional and marketing contexts
 - moods created by the main colour groups
- ◆ planning the design and justifying the choice of informational graphic to suit a given scenario
- ◆ identifying the design principles and elements used to create promotional layouts and displays

Produce and interpret pictorial sketches, pictorial drawings and 3D models by:

- ◆ using graphic communication equipment to create pictorial sketches of everyday objects and/or geometric forms in common pictorial formats that are accurate, well-proportioned and with very good line quality
- ◆ using graphic communication equipment to produce pictorial drawings and 3D computer-aided design models of everyday objects and/or geometric forms to within an accuracy of 1 mm
- ◆ using drawing standards, protocols and conventions which are appropriate to the purpose, including correct projection methods and use of scale
- ◆ describing a range of computer-aided design commands, techniques and practices employed in the production of 3D graphics and models, using appropriate terminology
- ◆ identifying and describing types of pictorial graphic communication used in the design, manufacturing and marketing of a product

Produce pictorial and 3D colour illustrations by:

- ◆ illustrating pictorial sketches or drawings of everyday objects to convey surface texture, tonal change and colour
- ◆ creating rendered 3D computer-aided design models of everyday objects to interpret the light source, surface texture and materials

- ◆ using computer-aided design or illustration software to create shadows or reflections of the 3D model on a surface
- ◆ describing using appropriate terminology, basic computer-aided design commands, techniques and practice employed in the production of 3D illustrations, using appropriate terminology

Create pictorial or 3D promotional displays by:

- ◆ creating, in response to a brief or theme, preliminary designs for a single-page promotional layout to display a rendered pictorial or 3D graphic and extended textual information with relevant visual impact
- ◆ using graphic communication equipment to produce a single-page promotional document incorporating a rendered pictorial or 3D graphic and extended textual information

Preparing for course assessment

Candidates should be given opportunities to practise activities similar to those expected in the course assessment. For example, teachers and lecturers could develop questions and tasks similar to those exemplified in the specimen question paper and specimen coursework assessment task.

In addition, the course has time which can be used at the discretion of teachers or lecturers to prepare for course assessment. This time may be used at various points throughout the course for consolidation and support.

For the question paper, time is required for:

- ◆ revision and consolidation of learning
- ◆ question paper techniques
- ◆ familiarisation with past, specimen and sample question papers
- ◆ practice question paper(s) — eg prelim examination

For the assignment, time is required for:

- ◆ revision and consolidation of learning
- ◆ assignment techniques
- ◆ familiarisation with past, specimen and sample assignments
- ◆ practice assignment(s)

Developing skills for learning, skills for life and skills for work

Course planners should identify opportunities throughout the course for candidates to develop skills for learning, skills for life and skills for work.

Candidates should be aware of the skills they are developing and teachers and lecturers can provide advice on opportunities to practise and improve them.

SQA does not formally assess skills for learning, skills for life and skills for work.

There may also be opportunities to develop additional skills depending on approaches being used to deliver the course in each centre. This is for individual teachers and lecturers to manage.

Some examples of potential opportunities to practise or improve these skills are provided in the following table:

Skill	How to develop
2 Numeracy	
2.2 Money, time and measurement	<ul style="list-style-type: none"> ◆ applying measuring and dimensioning techniques
4 Employability, enterprise and citizenship	
4.2 Information and communication technology (ICT)	<ul style="list-style-type: none"> ◆ using graphic packages ◆ using digital input and graphic devices
5 Thinking skills	
5.2 Understanding	<ul style="list-style-type: none"> ◆ describing techniques and their application ◆ describing the impact of graphic activities
5.3 Applying	<ul style="list-style-type: none"> ◆ applying graphic knowledge to simple problems and in communicating ideas
5.4 Analysing and evaluating	<ul style="list-style-type: none"> ◆ evaluating the impact of graphics ◆ analysing and evaluating existing and new graphic solutions

Appendix 2: standards and conventions — information and support for candidates











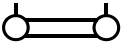

















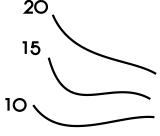
This appendix provides information on the expected use of standards and conventions for SQA Graphic Communication National Courses. It is not an exhaustive list of terms used in the graphics industry and does not cover every single term referred to in the course specifications. It should be considered as guidance and should be read in conjunction with the rest of the course specification.

Note: this appendix **must not** be taken into the examination or displayed in any room where an examination is taking place.

Building drawing symbols





These symbols are extracted from the British Standard (BSI). You may be required to use these symbols in your assignment or project, or be asked about them in the question paper.


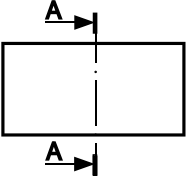
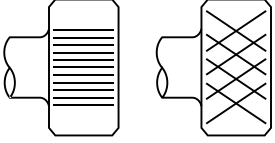
You **must** use the symbols and terms specified below:

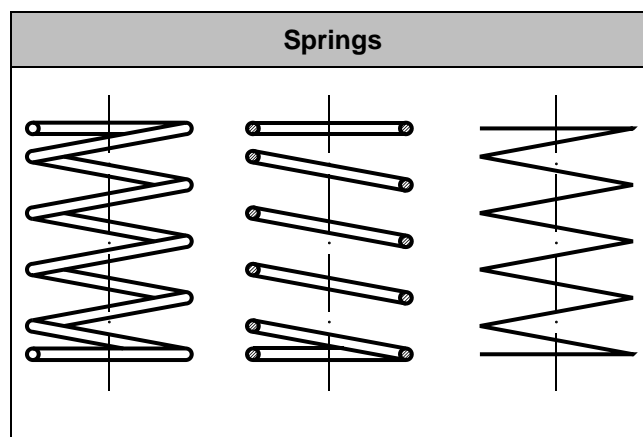
Lamp	Switch	Socket	Radiator	
				
Shower tray	Bathtub	Wash basin	Sink	WC
				
Sinktop	Heated towel rail	Concrete	Brickwork	
				
Door	Wood sawn, any type	Insulated board	Block work	
				
Fixed window	Window — hinged at side	Window — hinged at top	Window — hinged at bottom	
				
Window — pivoted, horizontal axis	Window — sliding horizontally	Drainage	North point	
				
Existing tree	Existing tree — to be removed	Proposed tree	Contours	
				

Technical graphic line types

These are the technical graphic line types that you must use in your work.

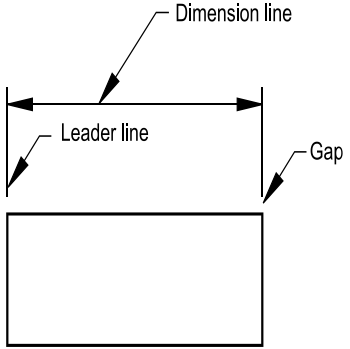
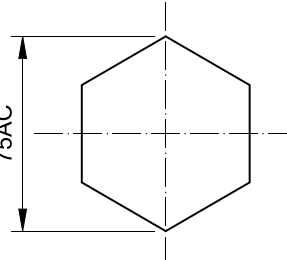
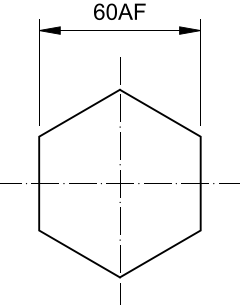
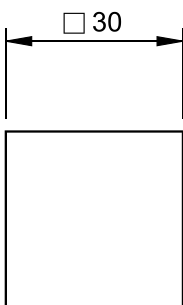
Outline solid	Projection line	Hidden detail line	Centre line
 <p>Continuous thick line for visible edges and outlines.</p>	 <p>Continuous thin line for projecting between views.</p>	 <p>Dashed thin line for hidden detail.</p>	 <p>Long dash, dot, chain line for centres of symmetry.</p> <p>Note: BS 7308 (long dash, short dash chain) is also acceptable.</p>

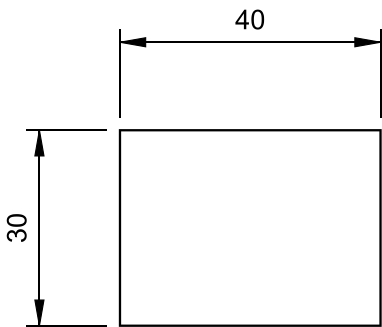
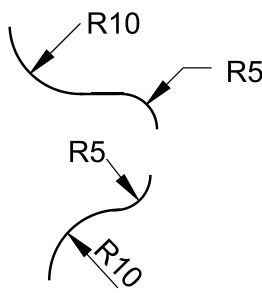
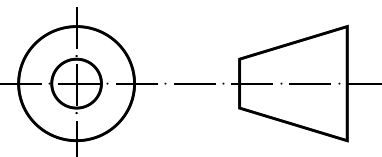
Fold line	Cutting plane	Knurling
 <p>Thin long dash, double dot, chain line to indicate folds on surface developments.</p> <p>Note: BS 7308 (long dash, short double dash chain) is also acceptable)</p>	 <p>Long dash dotted thin line, thick at ends.</p> <p>Note: BS 7308 (long dash, short dash chain line, thick at ends) is also acceptable</p>	 <p>Straight Diamond</p>

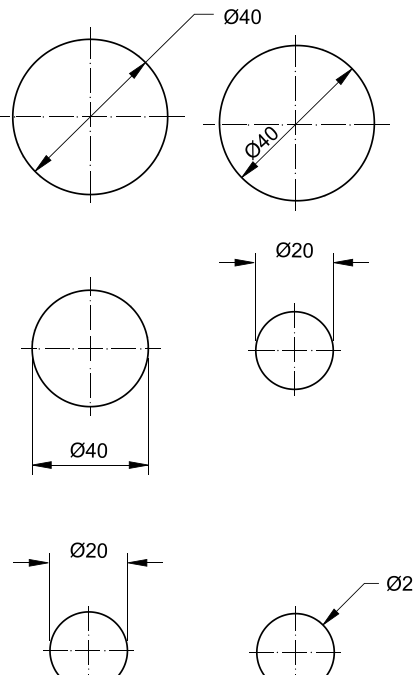
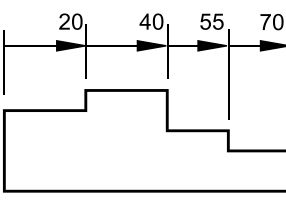
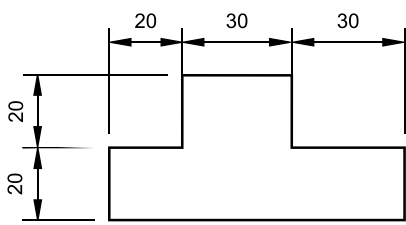


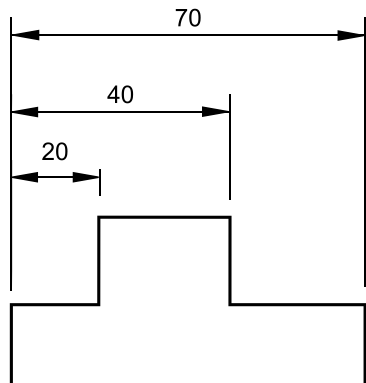
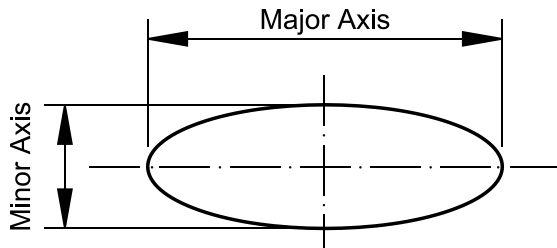
Dimensioning conventions

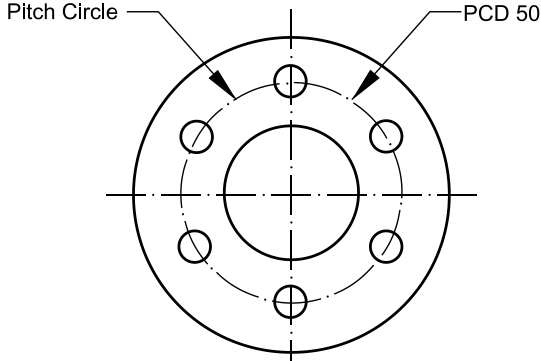
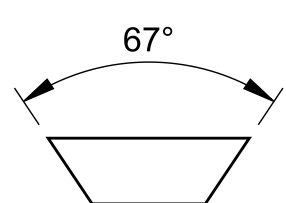
These are the conventions for technical graphic dimensioning that you must use in your work.

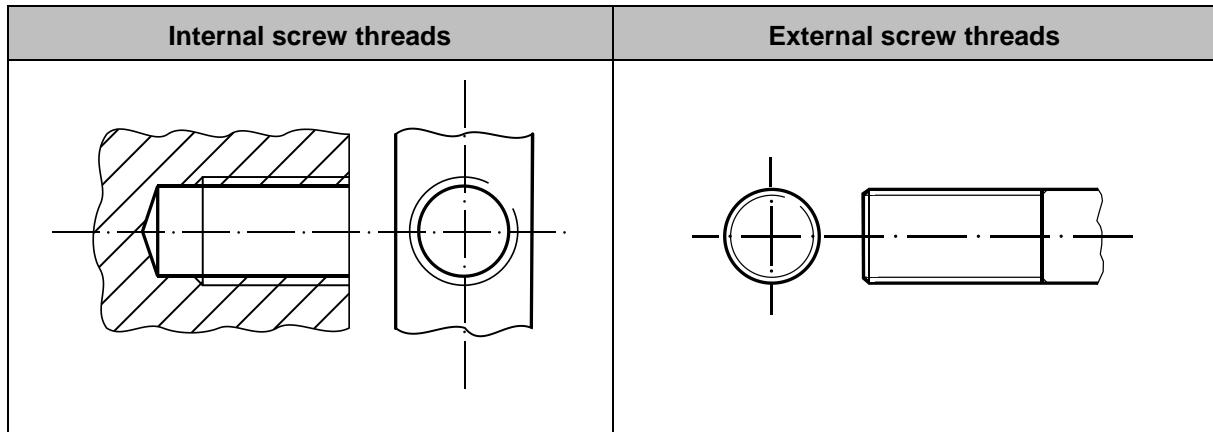
Leader line	Across corners	Across flats	Square
 <p>Narrow lines which lead from points on a view to the arrowhead dimension lines.</p> <p>A small gap should be left between the view and the leader line.</p>			

Linear	Radial	Projection symbol
		 <p>3rd angle projection</p>

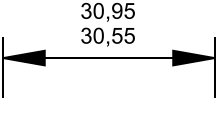
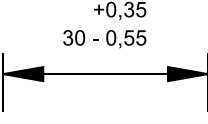
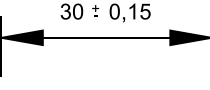
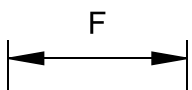
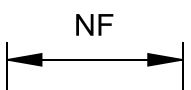
Diameter	Running	Chain
 <p>Technical drawings of a stepped shaft. The top row shows two front views of the shaft with diameters of $\varnothing 40$ and $\varnothing 40$. The middle row shows a side view with a diameter of $\varnothing 40$ and a detail view of a diameter of $\varnothing 20$. The bottom row shows a detail view of a diameter of $\varnothing 20$ and another detail view of a diameter of $\varnothing 20$.</p>	 <p>Running dimension drawing of a stepped shaft. The lengths of the steps are indicated as 20, 40, 55, and 70.</p>	 <p>Chain dimension drawing of a stepped shaft. The lengths of the steps are indicated as 20, 30, and 30. The heights of the steps are indicated as 20.</p>

Parallel	Major and minor axis
 <p>Parallel dimension drawing of a stepped shaft. The lengths of the steps are indicated as 70, 40, and 20.</p>	 <p>Major and minor axis drawing of an ellipse. The Major Axis and Minor Axis are labeled.</p>

Pitch circle diameter	Angular dimension
 <p>Pitch circle diameter drawing of a gear. The Pitch Circle and PCD 50 are labeled.</p>	 <p>Angular dimension drawing of a trapezoid. The angle is indicated as 67°.</p>



Tolerances

Common tolerance	Asymmetrical tolerance	Symmetrical tolerance	Functional tolerance	Non-functional tolerance
 <div style="border: 1px solid black; width: 100%; height: 40px; margin-top: 5px;"></div>	 <div style="border: 1px solid black; width: 100%; height: 40px; margin-top: 5px;"></div>	 <div style="border: 1px solid black; width: 100%; height: 40px; margin-top: 5px;"></div>		
<p>The common method shows the upper limit of the size placed above the lower limit.</p>	<p>The asymmetrical method shows the nominal size plus the upper and lower limits of the tolerance.</p>	<p>The symmetrical method shows the nominal size and the symmetrical tolerance expressed as a plus and minus.</p>	<p>A dimension that is essential to the function of a component or space.</p>	<p>A dimension that is not essential to the function of a component or space.</p>

Administrative information

Published: September 2017 (version 2.0)

History of changes to course specification

Version	Description of change	Date
2.0	Course support notes added as appendix	September 2017

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