

Higher National Unit Specification

General information for centres

Unit title: Digital Printing Systems

Unit code: F0PA 35

Unit purpose: This Unit is designed to provide candidates with a broad knowledge of the theoretical concepts, principles and processes of digital printing processes. The Unit adopts a structured approach to the processes of digital printing: from the requirements of digital files for output by digital printing to a survey of the processes used in digital printing and their suitability for various kinds of printed output and the calibration and quality control of output. The Unit will be of interest to those studying the HNC/HND Printing or those following a career in the print industry.

On completion of the Unit the candidate should be able to:

- 1 Produce digital files for output.
- 2 Evaluate the suitability of digital printing for types of work and print job requirements.
- 3 Evaluate the image output systems used.

Credit points and level: 1 HN Credit at SCQF level 8: (8 SCQF credit points at SCQF level 8*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Recommended prior knowledge and skills: Access to this Unit is at the discretion of the centre. It would be beneficial if candidates have good computer skills, knowledge of commercial printing processes, pre-press and desktop publishing (DTP). This could be demonstrated by the achievement of the Units *Print Production Processes and Design for Print: Digital Workflows* and *Desktop Publishing* at SCQF level 7, equivalent qualifications or relevant work experience.

Core Skills: There are opportunities to develop the Core Skill of Information Technology at SCQF level 6 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

Context for delivery: If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

Assessment: This Unit should be assessed holistically by means of a portfolio of evidence which includes: a range of pro formas, image files and digital prints. Where this is not possible, Outcomes may be assessed individually. The focus of the Unit is on the production of a quality end product and the understanding of the processes leading to the achievement of this. Assessment will therefore centre around production and evaluation of the product and on-going assessment of practical processes.

Higher National Unit specification: statement of standards

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The sections of the Unit stating the Outcomes, knowledge and/or skills, and evidence requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the knowledge and/or skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Produce digital files for output

Knowledge and/or skills

- ◆ Files used for pre-press processes
- ◆ File requirements and flightchecking
- ◆ Software used for pre-press processes

Evidence Requirements

Candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can produce, from a supplied Native format DTP file, one file of each type; PostScript, EPS, PDF — Press, PDF — Print, PDF — Screen. Each file has to be checked using flightchecking and retained on a file server or CD.

The centre should provide a pro forma with a section for each file type outlining the purpose of each of the file types and their use(s) should be completed under open-book supervised conditions.

Candidate performance should be recorded in an Observation schedule.

Assessment guidelines

Part of the evidence for this Unit will relate to the candidate's involvement in a series of tasks relevant to the production of work by digital printing.

The assessment for this Outcome may be assessed by means of practical work and related completed pro forma records. This should be combined with Outcomes 2 and 3 as part of a single holistic assessment instrument for the Unit, details of which are given under Outcome 3 below.

Outcome 2

Evaluate the suitability of digital printing for types of work and print job requirements

Knowledge and/or skills

- ◆ Types of work and print job requirements
- ◆ Types and capabilities of digital printing equipment
- ◆ Comparison with conventional printing

Higher National Unit specification: statement of standards (cont)

Unit title: Digital Printing Systems

Evidence Requirements

Candidates will need to provide evidence to demonstrate their knowledge and skills by showing that they can:

- ◆ satisfactorily complete a pro forma detailing three print job requirements and three different types of work
- ◆ compare the capabilities of three different types of digital printing equipment
- ◆ compare digital printing with conventional printing, highlighting three contrasting areas

The print job requirements, types of work, kinds of digital printing equipment and areas of comparison with conventional printing will be sampled for the purposes of assessment. The centre-devised pro forma will be integrated with the evidence gathered for Outcome 1. The pro forma used will require a minimum of 300 words to complete.

This assessment will be done under open-book supervised conditions.

Assessment guidelines

The candidate will be expected to demonstrate knowledge of the suitability of digital printing for a range of print job requirements, types of work, types and capabilities of equipment in use and areas of comparison with conventional printing. Alternative samples of types of work, print job requirements, equipment and areas of comparison with conventional printing will be specified for candidates not achieving a pass in their first assessment submission. This open-book assessment will be integrated with the assessment submitted for Outcome 1 using the supplied pro forma.

Outcome 3

Evaluate the image output systems used

Knowledge and/or skills

- ◆ Image processors
- ◆ Image engine systems
- ◆ Calibration of digital printing machines
- ◆ In-line finishing techniques

Evidence Requirements

Candidates will need to provide evidence to demonstrate their knowledge and skills by showing that they can evaluate three samples of digital printing in terms of use of image processor functions, image engine types, calibration, in-line finishing techniques used.

The evidence should cover three different image processor functions, three different image engine types, three different aspects of calibration and three different in-line finishing techniques. This assessment will be integrated with the assessment submitted for Outcomes 1 and 2.

The assessment will consist of a multi-part pro forma and will be carried out under open-book supervised conditions.

Higher National Unit specification: statement of standards (cont)

Unit title: Digital Printing Systems

Assessment guidelines

The candidate may be encouraged to demonstrate knowledge gained by practical involvement with digital printing equipment, by reference to files, and samples of digital printing produced during the course of Unit delivery and as specified in the evidence requirements. The assessment for this Outcome may be integrated with the assessments submitted for Outcomes 1 and 2 and cross referencing of information derived from the work of these Outcomes will be encouraged.

Alternative samples of types of processor functions, image engine types, calibration and in-line finishing techniques will be specified for candidates not achieving a pass in their first assessment submission.

Administrative Information

Unit code: F0PA 35
Unit title: Digital Printing Systems
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Higher National Unit specification: support notes

Unit title: Digital Printing Systems

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

The Unit was developed for the HNC/HND Printing where it is an optional Unit. It is primarily intended to prepare candidates to undertake tasks or management functions in the field of digital printing processes. The Unit adopts a structured approach to the generation of digital files and their output via digital printing. It prepares candidates for this role by providing them with the underpinning knowledge needed to carry out this type of task effectively. It is primarily intended for candidates in printing, publishing, graphic design, and photography. It would also be relevant to those with appropriate work experience such as the use of desktop publishing or computer graphic packages. Candidates will be expected to exercise a degree of autonomy in carrying out the tasks required for the Unit.

There is no prescription regarding particular software and hardware facilities. However, tasks should replicate working practices for digital printing in terms of software and hardware used in the printing industry. The relevant facilities should be available to the candidate throughout the duration of the Unit. It is acceptable for candidates to provide and output their own digital files where this is possible (subject to lecturer approval). Although these activities could enrich the learning process, they are not directly assessable as part of the Unit.

Output files should be processed by candidates. Files should be digitally printed in colour. Comment should be provided by candidates on their evaluation of the quality of their work relative to the files and image engine. It is recommended that tutors should discuss with candidates the quality of their output and if required additional work should be undertaken and a new proof produced.

Throughout this Unit the following topics should be covered:

Outcome 1

Types of file used for pre-press processes: Native, PostScript, Encapsulated PostScript Format, Portable Document Format (PDF). Software used for pre-press processes: DTP, flight checking, imposition, trapping, variable data.

Digital files should be provided for make up and preparation for output. Candidates may also prepare their own files.

The work undertaken by the candidate for file processing and the file size of stored files should be recorded on a pro forma for each file. Knowledge of the factors influencing the choice of file type for output should be indicated via completion of a section of each of the pro formas.

Outcome 2

Print job requirements: lead times, run length, print on demand, variable data, and substrates. Types of work: manuals, books, brochures, reports, print on demand, packaging, advertising, posters, fine art prints, proofing, and samples.

Higher National Unit specification: support notes (cont)

Unit title: Digital Printing Systems

Comparison with conventional printing: material costs, versatility, quality, print speed, print and distribute and distribute and print, trends.

The candidate will be presented with a sampling of the range of work for which digital printing could be considered. The candidate should then complete a pro forma assessment.

Outcome 3

Image processors Raster Image Processors: functions, PostScript levels, speed, image structures, variable data handling, RIP software/hardware.

Image engine systems: colour laser (toner powder and electro-ink), ink jet, continuous flow, drop on demand (bubble jet, piezo crystal, phase change), thermal wax transfer, dye sublimation, Direct Imaging offset litho (DI).

Calibration of digital printing machines: purpose of calibration, quality control guides, calibration techniques.

In-line finishing techniques: Cutting, folding, wire stitching, adhesive binding, laminating, coating.

Guidance on the delivery and assessment of this Unit

This is a rapidly evolving area of technology and the emphasis of the delivery will need to reflect current trends. Candidates will be encouraged to carry out their own investigation of current trends via the internet and trade magazines. Industrial visits could also enrich the learning process.

The extent of the candidate's practical involvement will depend on the range of equipment available. Ideally this Unit would be delivered with access to digital printing equipment and not solely by theoretical presentations, however if distance learning is to be used this may not be possible.

Opportunities for developing Core Skills

This Unit offers opportunities to further develop and extend the Core Skill, 'Using Information Technology' at SCQF Level 5. The Unit does not seek to embed the skill as a development of all elements is seen as a likely pre-requirement of the Unit. Areas which involve developing IT skills:

- ◆ File types
- ◆ Flightchecking
- ◆ Software for pre-press
- ◆ Use of network facilities

It is critical that the delivery and assessment process identifies the transferable nature of this skill to other vocational contexts.

Higher National Unit specification: support notes (cont)

Unit title: Digital Printing Systems

Open learning

This Unit could be delivered by distance learning providing that the candidate has access to suitable computer hardware and software i.e. a professional DTP package, Adobe Acrobat and Microsoft PowerPoint. The teaching notes and pro formas can be provided as PDF or word processed files. Digital files can be provided in various formats as required. Microsoft PowerPoint presentations would be suitable for illustration of equipment design, image structures etc.

If this Unit is delivered by open or distance learning methods, additional planning and resources may be required for candidate support, assessment and quality assurance such as oral questioning and on-line responses. A combination of new and traditional authentication tools may have to be devised for assessment and reassessment purposes. For further information refer to the SQA guide, Assessment and Quality Assurance of Open and Distance Learning (www.sqa.org.uk).

Candidates with disabilities and/or additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative Outcomes for Units. For information on these, please refer to the SQA document *Guidance on Alternative Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs*, which is available on SQA's website: www.sqa.org.uk.

General information for candidates

Unit title: Digital Printing Systems

This Unit is designed to enable you to evaluate the suitability of digital printing for various kinds of printed work. The techniques used for personalised production of work will be covered. The possible options for in-line finishing with some equipment identified and particular problems posed by digital prints for some finishing operations are explored. Calibration and quality control is an essential part of production processes and the coverage of this area will provide information required by management and clients. You will examine various digital printing techniques and their particular characteristics and suitability for different applications, along with the evaluation of the file types available and the opportunity to gain experience in the techniques used to ensure that files are output properly. Your coverage of digital printing techniques and comparisons with competitive processes will be of value in considering careers in administration as well as technical occupations.

In undertaking this Unit you will also develop your IT skills.

You will be assessed through one task which will require you to produce files for output by digital printing, evaluate the suitability of digital printing for different types of work, make comparisons with conventional printing, and evaluate different digital printing processes.