Unit 28: Commercial Photographic Laboratory Operations

Unit code: R/502/5228

QCF Level 3: BTEC National

Credit value: 10

Guided learning hours: 60

Aim and purpose

The aim of this unit is to give learners the opportunity to develop the range of skills and techniques associated with printing and processing photographic materials in the commercial photographic laboratory.

Unit introduction

This unit gives learners the experience of commercial photographic laboratories. It aims to provide learners with the underpinning knowledge for a range of skills and techniques associated with the processing and printing of photographic materials in a professional laboratory.

Underpinning knowledge will be provided by the centre and in the workplace. Tutors should liaise with a trainer responsible for learners' work experience, or the provider directly, to ensure that an appropriate range of techniques and processes is experienced. The practical evidence for this unit will be generated and gathered in the workplace, and evidence of underpinning knowledge should also be assessed in the working environment. This will include observation, verbal and written questioning, witness testimonies and the undertaking, monitoring and evaluation of a work logbook. Learners will experience colour as well as black and white processing.

Learners will be taught how to set up and use processes and equipment and identify and correct problems. Learners will be taught how to inspect and clean processing machines. They will learn how to use chemicals for film processing find out about related health and safety requirements such as COSHH regulations and the associated legal requirements for the photographic profession. Learners will process and print negatives and transparencies which they have created for other units.

Practical and underpinning knowledge will be supported by an evidence file produced by the learners, who will build a reference file on comparing processing equipment, based on manufacturers' instruction and data sheets, information from internet sites and articles from photographic magazines. Technical evidence will be recorded to demonstrate and evaluate practical knowledge.

Learning outcomes

On completion of this unit a learner should:

1   Be able to set up and maintain processing and printing equipment

2   Be able to process exposed film and printed material using non-continuous equipment

3   Be able to print photographic images using non-continuous equipment

Unit content

1 Be able to set up and maintain processing and printing equipment

Set-up processes: eg processing principles, replenishment settings, rates, checks, adjustments, hardware and software settings, negative classification (subject lighting, colour or density failure), processor setup, monitoring procedures (processing aims, problem identification, nature and application of densitometry), processor-monitoring

Control and maintenance procedures: eg inspection intervals, correct use of cleaning agents, disposal of cleaning waste, maintenance documentation

Understanding properties and safe handling of chemicals: chemical storing; mixing; evaporation; contamination; safe treatment of spillages; protective clothing; COSHH regulations; manufacturers' manuals and guidelines; legislation on pollution and environmental protection

2 Be able to process exposed film and printed material using non-continuous equipment

Process exposed film and printed material on non-continuous processors: machine processor loading; film notching codes; processing and exposure problems; darkroom issues eg fogging, chemical marks, physical damage, exposure faults, camera fogging, exposure categories

Workplace procedures and sorting methods: eg stray light, logical accessories, cleanliness

3 Be able to print photographic images using non-continuous equipment

Print photographic images: printing materials preparation eg clean negatives, transparencies; paper eg grade, contrast, surface texture

Identify common processing and 'in camera' faults: light damage; dust and chemical damage; physical damage; focusing; exposure; framing; lighting balance

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P1 follow guidelines in setting up equipment to maintain controlled printing and processing [IE, CT, RL, TW, SM, EP]	**M1** demonstrate purpose and understanding in the effective use of darkroom systems and equipment	**D1** independently demonstrate an in-depth understanding of darkroom systems to produce finished images.
P2 carry out the controlled processing of exposed film and printed material working with non-continuous equipment [IE, CT, RL, TW, SM, EP]	**M2** demonstrate consistency in the effective processing and printing of images.	
P3 produce printed photographic images using non-continuous equipment. [IE, CT, RL, TW, SM, EP]		

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

This unit will provide learners with an opportunity to confirm understanding, skills and techniques associated with the printing and processing of photographic materials in the commercial photographic laboratory. Assessment will take place in the centre for underpinning knowledge and in a commercial photographic laboratory for work-based learning and observation.

Tutors need to devise an interactive approach to delivering this unit, with an appropriate combination of demonstrations, visits and work-based learning over extended periods in a commercial photographic laboratory so that learners can generate and gather practical evidence alongside additional underpinning knowledge also assessed in the workplace. It is useful if the learning environment is able to deploy a work-based learning coordinator to facilitate and monitor placement and assessment procedures. Assessment will include observation, verbal and written questioning and the evaluation of a work logbook. Tutors and/or facilitators should liaise with the trainer responsible for learners' work experience to ensure that an appropriate range of techniques and processes, in the context of the unit assessment criteria, are experiential.

Acquiring underpinning knowledge of and practical skills in the use of equipment, materials and processes is fundamental and appropriate maintained resources should be readily available in the learners' centre and/or placement environment.

For learning outcome 1, learners need to learn how to set up, control and maintain processing and printing equipment. This may include set-up procedures such as establishing processing aims, checking and setting replenishment rates, processing checks and adjustments, hardware and software settings, negative classification (in relation to subject lighting, colour or density failure) and producing processor set up documentation. Learners should also be taught how to monitor and maintain procedures, such as processing aims, identifying problems (the nature and application of densitometry) and referencing processor-monitoring documentation. Maintenance procedures should also be addressed, such as inspection intervals, correct use of cleaning agents, disposal of cleaning waste and maintenance documentation. In doing so learners need to develop their understanding of the properties of processing chemicals and learn how to handle chemicals safely. This may include chemical storing, mixing, evaporation, contamination, safe treatment of spillages and protective clothing, COSHH regulations, manufacturers' manuals and guidelines, legislation on pollution and environmental protection.

Tutors should teach learners will need to learn how to process exposed film and printed material on non-continuous processors, how to load machine processors correctly and recognise film notching codes. Learners should be encouraged to build a reference file based on manufacturers' data sheets, information from internet sites, and articles extracted from photographic magazines. This acquisition of underpinning knowledge should be incorporated into assessment evidence, encouraging a positive approach to collecting and archiving relevant documentation for easy recall.

For learning outcome 2, learners need to know how to specify non-standard processing requirements and assess process suitability in a professional context appropriate to clients' requirements. This involves learning how to identify processing and exposure problems (for example darkroom fogging, chemical marks, physical damage, exposure faults, camera fogging, over and underexposure). It also involves learning about workplace procedures and sorting methods (for example cleaning surfaces, checking for stray light, logical layout of accessories and cleanliness).

For learning outcome 3, learners need to be taught how to print photographic images using non-continuous equipment including how to adjust settings and the limitations of machine printing. Learners need to know how to:

- prepare material for printing (for example clean negatives and transparencies)
- select paper (for example in terms of grade, contrast and or surface texture).

Learners need to correctly employ British Standard lighting for viewing test strips and prints to enable them to assess initial and final printer output (for example in terms of exposure, contrast and colour balance). In doing so, learners also need to learn how to identify common processing and 'in camera' faults. This may include:

- light damage, dust and chemical damage and physical damage
- focusing, exposure, framing, and lighting balance errors.

Learners also need to be taught about the legal requirements, for example copyright. Evidence will be generated through observation of practical activities, discussion and final evaluation of practical work.

Development for learning outcome 3 must ensure that learners have a complete understanding of a photographic processing laboratory and are able to complete the necessary tasks with minimal support. Wherever appropriate, practical results should be recorded as well as being supported by a written evaluation and stored appropriately for easy retrieval.

Evidence for underpinning knowledge could be drawn from witness statements and recorded question and answer sessions. Learners should be able to explain the processes offered by a professional laboratory and feel competent in the practice of printing and processing of photographic materials in the commercial photographic laboratory.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Group introduction to unit content
Group introduction to unit activities (which will involve work-based learning)
Group introduction to potential work-based learning and assessment provider(s), and discussion with available centre work-based learning coordinator
Internal and external briefing analysis and clarification of any ambiguities
Unit activities planning in self-managed, directed and work-based learning context
Outline range of commercial laboratory print and processing techniques
Discuss and promote learner initiated research, experimentation, evaluation and revision methodology, techniques and processes
Discuss the importance of learner directed methods for documenting research, experimentation, proposals, evaluations and, revisions
Demonstrate the importance of learner directed timelines to include research, experimentation, recordings, proposals, evaluations and revisions
Assignment 1: Commercial Photographic Printing Processes
Discuss and establish principles for recording investigations and practice into setting up, controlling and maintaining processes and the safe handling of chemicals
Demonstrate the range of set-up processes by research, observation and practice for assessment
Demonstrate timeline for appropriate control and maintenance of laboratory equipment, cleaning, replacement and waste disposal of hazardous materials and for assessment
Evidence the properties and safe handling of chemicals in a commercial photographic laboratory, working appropriately and safely within COSHH regulations and with manufacturer's manuals
Learners to regularly document and record research, legislation, practice and references in an appropriate format for storage, recall and assessment
Assignment 2: Processing Exposed Film and Printed Material with the Controlled Use of Non-continuous Equipment
Learners investigate and record the principles for processing exposed film and printed material, describing equipment and including loading and codes for assessment
Encourage learners to recognise and record processing and exposure problems and the range of potential darkroom issues
Establish workplace methods through observation of others, training and practice, to be assessed
Learners to regularly document and record findings, parameters, practice and references in an appropriate format for storage, recall and assessment

Topic and suggested assignments/activities and/assessment
Assignment 3: Printing Photographic Images Using Non-continuous Equipment
Review and discuss documentation and recordings from Assignments 1 and 2 relating to the printing of photographic images
Learners print a selection of photographic images in a commercial laboratory environment, recording common faults and troubleshooting processes in the printing of photographic images in a commercial laboratory environment for assessment
Agree and record appropriate revisions and parameters and print to particular professional requirements for assessment
Review of unit and assessment

Assessment

For P1, learners must set up, control and maintain processing and printing equipment, recording their competencies in an appropriate format. They should follow guidelines in the setting up of processing equipment, and maintain the printing process in such a way that the quality of processed and printed materials is established. They may require tutor or professional assistance at different stages to achieve this. They should record all relevant technical and health and safety guidelines.

For P2, learners need to process exposed film and printed material using non-continuous equipment in a controlled manner, recording their competencies in an appropriate format. They should demonstrate their ability to work safely and follow all health and safety and COSHH guidelines for safe working practices. Technical knowledge and understanding should be appropriate to the task.

For P3, learners must print photographic images using non-continuous equipment capably, recording common faults, adjustments and troubleshooting methods in an appropriate format. They should demonstrate a basic functional ability to work in a printing environment, and to use printing equipment and processes. There may be inconsistencies in some of the work they produce.

For M1, learners must show purpose in their processing skills and their control of the processes. They should demonstrate a level of consistency and concentration in different stages of the processing and printing tasks listed for P1. Technical information should be absorbed and applied with more purpose and with a higher degree of self-reliance than at pass level.

For M2, learners must demonstrate a sustained and consistent approach to processing and printing and produce good quality prints. At merit level learners are expected to show a reasonable level of quality control in their work. The degree of consistency be evidenced in the outcomes and the application of correct and safe working practices. Learners should show a higher level of sustained concentration than at P2. Images produced should show a greater attention to detail and better avoidance of faults than in lower level work.

For D1, learners must independently demonstrate an in-depth understanding of darkroom systems to produce high quality finished images to professional requirements. Learners must show an in-depth understanding and ability to use the relevant printing and processing equipment independently. Images produced should show a professional approach to printing. Final outcomes must demonstrate a greater level of control and sophistication than work assessed at merit level.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1	**Assignment 1**: Commercial Photographic Printing Processes	Photographic printer induction.	Technical log or workbook including documents, diagrams and recordings which show informed understanding of the set up of processing and print equipment.
P2	**Assignment 2**: Processing Exposed Film and Printed Material with the Controlled Use of Non-continuous Equipment	Photographic printer processing film.	Technical log or workbook including documents, diagrams and recordings which show understanding of the setup of processing and print equipment.
P1, P2, P3 M1, M2 D1	**Assignment 3**: Printing Photographic Images Using Non-Continuous Equipment	Photographic printer printing images.	Technical log or workbook identifying common faults and troubleshooting in the printing of photographic images. Printed set of photographic images to a client's professional requirements.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Art and Design sector suite. This unit has particular links with the following unit titles in the BTEC Art and Design suite:

Level 1	Level 2	Level 3
Introduction to Photography	Working with Photography Briefs	Darkroom Practice
Vocational Contexts		Personal and Professional Development in Art and Design
		Darkroom Applications

National Occupational Standards

This unit also provides development opportunities for some of the underpinning skills, knowledge and understanding of the following National Occupational Standards:

Skillset Sector Skills Council

Photo Imaging

- PI-8 Start Up and Shut Down Laboratory Equipment
- PI-11 Mix and Store Processing Chemistry
- PI-12 Process Exposed Films
- PI-13 Print Photographic Images by Hand
- PI-14 Print Photographic Images by Machine
- X2 Ensure Your Actions Reduce Risks to Health and Safety
- X3 Conduct an Assessment of Risks in the Workplace
- X4 Develop Procedures to Control Risks to Health and Safety

Essential resources

Learners initially require access to a range of in-house processing equipment and chemicals. They also need access to a professional laboratory. Extended periods of work-based learning in a professional photographic laboratory are recommended and need to be organised for learners.

It is useful if the learning environment can deploy a work-based learning coordinator to facilitate and monitor placement and assessment procedures.

Employer engagement and vocational contexts

Centres should develop links with practising photographers to deliver assignments to learners or to provide work experience.

Links with employers are essential to the delivery of the programme for work experience and future employment.

Vocational learning support resources:

- Learning and Skills Network – www.vocationallearning.org.uk

Business and finance advice:

- local and regional Business Link – www.businesslink.gov.uk

Assignments should be vocationally relevant; centres should consider the delivery of 'live projects' for examples to support the vocational content of the unit and programme.

Skillset, the Sector Skills Council for Creative Media (www.skillset.org), provide details on its photo pages (www.skillset.org/photo) careers and the industry and has a regularly updated news and events page.

Indicative reading for learners

Textbooks

Berns R S – *Billmeyer and Saltzman's Principles of Color Technology, 3rd Edition* (Wiley-Interscience, 2000) ISBN 978-0471194590

Coote R – *Ilford Monochrome Darkroom Practice: A Manual of Black and White Processing and Printing* (Focal Press, 1996) ISBN 978-0240513683

Curtin D, Demaio J and Worth R – *The New Darkroom Handbook* (Focal Press, 1998) ISBN 978-0240802602

Graves C – *Elements of Black and White Printing* (Focal Press, 2001) ISBN 978-0240803128

Hunt R W G – *The Reproduction of Colour* (Wiley-Blackwell, 2004) ISBN 978-0470024256

Kodak Black and White Darkroom Dataguide (Kodak Publication, No R-20) (Eastman Kodak, 1988) ISBN 978-0879856021

Kodak Color Darkroom Dataguide (Eastman Kodak, 1998) ISBN 978-0879856113

Journals

Sinish R D – *The Reittabas Effect* – photography printing technique (PSA Journal, Sept 1997)

Websites

www.genesis-digital.net   Genesis printing services

www.spectrumphoto.co.uk   Spetrum online printing services

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit:

Skill	When learners are …
Independent enquirers	selecting information appropriate to investigating commercial photographic laboratory operations for the printing of photographic materials
Creative thinkers	exploring effective ways of collecting, logging and archiving important information and data relating to the processing and printing of photographic materials and commercial photographic laboratory operations
Reflective learners	reviewing, reflecting on and evaluating information appropriate to the printing and processing of photographic materials and working to professional requirements
Team workers	organising time, planning resources, handling information in the context of commercial photographic laboratory operations
Self-managers	allowing for own and others' opinions, suggestions training and proposals to be respected, considered, reviewed and actioned where appropriate
Effective participators	selecting information appropriate to the processing and printing of photographic materials and commercial photographic laboratory operations.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	planning and carrying out research into the processing and printing of photographic materials and commercial photographic laboratory operations
Creative thinkers	trying out alternative ways of developing personal and specialist skills
	adapting their ideas based on advice and guidance from tutors, peers and professionals
Reflective learners	setting personal and professional goals
	inviting feedback on own work and dealing positively with praise, setbacks and criticism
	evaluating their experiences and learning to inform development, confidence-building and professional goals
Team workers	seeking out technical skills guidance, showing flexibility when priorities change
	dealing with competing pressures, including personal and work-related demands
	seeking advice and support when needed
Self-managers	creating opportunities to develop personal and technical skills and competencies, allowing for own and others' suggestions and proposals to be respected, considered, reviewed and actioned where appropriate
	establishing effective evidence storage for information retrieval to support skills development and progress
Effective participators	Working and acting appropriately in a commercial photographic laboratory.

● Functional Skills – Level 2

Skill	When learners are ...
ICT – Use ICT systems	
ICT – Find and select information	
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	sourcing information from websites and electronic publications about photography and non-continuous processing and printing processes
English	
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	sourcing and reading information about processing and printing reading and absorbing information about health and safety relating to peripherals/equipment to be used
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	gathering and recording relevant technical information about equipment compiling information about processing and printing techniques.