Unit 125: Computer Applications in Fashion

Unit code: R/502/5424

QCF Level 3: BTEC National

Credit value: 10

Guided learning hours: 60

Aim and purpose

The aim of this unit is to develop and extend learners' skills in and understanding of Computer Aided Design/ Computer Aided Manufacture (CAD/CAM) applications for fashion design, pattern manipulation and garment and accessory construction. Learners will achieve this through practical computer sessions using a variety of fashion industry software applications.

Unit introduction

The UK clothing industry uses the latest CAD/CAM computer technologies to compete in the global fashion industry. These technologies include visualising garments, accessories and fabrics, pattern drafting, intelligent pattern grading and cutting systems, garment and accessory sizing, 3D body scanners and product data management systems.

Learners will, in part one of this unit, undertake practical work to explore the effects of, and potential for, computer technology in fashion design. This will involve gathering research material electronically and using a variety of specific fashion software and hardware for design, visualisation and image manipulation techniques.

Part two of this unit will extend learners' skills in using computers to aid pattern construction and pattern manipulation. Learners will investigate (CAM) techniques and how these are used in pattern and manufacture processes.

Learners will use industry compliant software, be introduced to new technologies including 3D body scanners, virtual try on and size recommendation and virtual drape and fit. Learners will develop their understanding of UK clothing manufacturing and how it operates through investigation, visits to, and from, manufacturers and practical exercises.

In the third part of the unit learners will review the potential effects of electronic communication and systems on fashion design and marketing, including product data and life cycle management systems and e-supply chain value added services and the benefits they bring to the industry and the consumer. They will develop awareness and understanding of computer integrated manufacture (CIM) processes and 'quick response' systems including animated/computer controlled cutting, made to measure and mass customisation systems and how they contribute to the clothing industry.

Learners will also be introduced to new computer technology including intelligent pattern grading and cutting systems, single-ply, high-speed cutters and 3D optical body scanners to capture body size and fit.

Learners will have opportunities for technical demonstration, self-directed learning. Practical work experience is encouraged to aid learner progression into employment in the clothing industry or higher education.

Learning outcomes

On completion of this unit a learner should:

1 Be able to use CAD to aid the design and visualisation of fashion and clothing

2 Be able to use CAD/CAM for the processes of pattern manipulation and garment and accessory construction

3 Understand the potential effects of current technological developments on the fashion industry.

Unit content

1 Be able to use CAD to aid the design and visualisation of fashion and clothing

CAD research: gathering material electronically eg CD ROMs, internet

CAD in garment, accessory and fabric design: eg designing, illustrating, fabric sampling; software packages eg vector drawing, bitmap painting, specialist fashion software

CAD in garment, accessory and fabric visualisation: image techniques (scanning, manipulating) eg software, filters, colour-ways, proportion change

2 Be able to use CAD/CAM for the processes of pattern manipulation, garment and accessory construction

Use industry software: eg grading, sizing, pattern manipulation, lay-planning, cutting, sewing, costing sheets

3 Understand the potential effects of current technological developments on the fashion industry

Electronic communication systems: effects eg fashion websites, ordering online, fashion pop ups

Analysing CAM systems: eg high-speed fabric cutters, production, construction

Analysing CAD systems: eg fabric designs, fabric samples, sampling, 2D modelling, 3D modelling

'Quick response' systems: eg fast fashion, global fashion markets, trends, product life cycle management

Computer technology in production: CIM processes; industrial use eg management systems, production planning

Technological developments: eg remote working, environmental issues, sustainability, new markets

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 produce design ideas using fashion software applications [CT, RL, SM]	**M1** use specialist CAD/CAM techniques with skill, control and understanding to produce a variety of outcomes	**D1** use specialist CAD/CAM techniques with skill, discrimination, control and understanding to create a range of outcomes that recognise the potential and limitations of the technology
P2 use CAD/CAM for the processes of pattern manipulation and garment and accessory construction [CT, RL, SM]	**M2** apply an individual approach to structuring and presenting a coherent analysis of the benefits and limitations of current technological developments.	**D2** apply an in-depth understanding in expressing a clear and coherent analysis of current technological developments, and in drawing effectively argued conclusions.
P3 explain the use of technological applications and systems currently being used in the fashion industry. [IE, 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

For this unit learners should have access to a range of industry compliant computer facilities and applications including DTP and illustration applications, vector drawing and bitmap editing, as well as specialist CAD/CAM software. Specific industrial software should be available to give learners relevant experience to progress into employment or further higher-level study after the programme.

Tutors should introduce this unit to learners through formal delivery and workshop demonstrations of hardware and software. Learners will also need hands-on experience to explore their own responses, designs and work once they have understood the computer technology with the appropriate software packages. Drop-in access should be built into the learning programme to accommodate this.

Following an introduction to the range of fashion technologies currently used in the industry, learners will, in the first part of this unit, focus on 2D-related software and applications. Learning outcome 1 requires learners to research using electronic library resources. Independent self- directed learning should be encouraged.

Learning outcome 2 is closely linked with learning outcome 1. Initial visits to fashion manufacturing companies together with industrial speakers and manufacturing demonstrations will contextualise the subject for learners. This stage will also require the learner to access dedicated clothing industry 3D hardware and software for both production and manufacturing techniques and processes.

Learning outcome 1 could be evidenced through visual design work supported by a word-processed report.

A word processed report, production file and/or work saved in a CD disk will be the main focus of learning outcome 2 for the learner. This will show understanding of a variety of CAD/CAM techniques to include use and observation.

In learning outcome 3 learners will explore how fashion designers and manufacturers can use new technology to respond quickly to market trends. The use of product life cycle management systems and understanding of the potential effects of electronic and computer technologies on the fashion design industry, including pattern construction, manufacturing and marketing, can be delivered through formal lectures with input from industry specialists and factory visits.

Research using the internet and library resources will form an essential part of the learning programme and tutors should guide learners to specific internet sites used for market intelligence, fabric and equipment sourcing and to the library for specialist books, magazines and CD ROMs.

Outline learning plan

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.

Topic and suggested assignments/activities and/assessment
Introduction to unit and structure of the programme – whole group.
Introduction to the range of CAM/CAM fashion technology applications – whole group.
CAD for design and visualisation. Introduction to specific fashion CAD applications – whole group.
2D CAD applications Part 1 – practical session – whole group.
Assignment 1: Fashion Presentation • Learner-initiated research on a range of fashion magazine covers and the associated computer applications and techniques. • Using scanning techniques, produce a fashion figure drawing. • Using the figure drawing, design and produce a cover for a fashion magazine using specific CAD software. • Produce report. • Present and discuss work.
CAD/CAM for 3D manufacture. Introduction to specific fashion applications for production and manufacture – whole group.
3D CAD/CAM applications Part 2 practical session – whole group. CAM production and manufacture of fashion and clothing ideas. Costing. Lay planning. Spreading and cutting.
Assignment 2: Production File • Produce a folder/disk which demonstrates production and manufacturing techniques using a range of industry software. • Analyse findings. • Present work and review it.
Assignment 3: Technologies and the Fashion Industry Introduction to product life cycle management and associated technologies. Learners research the use of CAD/CAM technologies in three selected fashion and clothing companies. Illustrated report on the development and production of garments and accessories. Evaluate the key benefits of new technologies.
Review of unit and assessment.

Assessment

For P1 and P2, learners will be expected to extend their understanding of CAD/CAM for the fashion and clothing industry and to use CAD/CAM effectively to aid the design and visualisation of fashion and in the process of pattern manipulation and garment and accessory construction. Practical work should be saved on related disks (USB sticks, CD ROM) and where appropriate presented in a folio.

P3 requires learners to present a realistic exploration of technological developments in the fashion industry. This will include reviewing and analysing electronic, CAD/CAM and 'quick response' technological systems and producing an illustrated word-processed report.

For M1, will be expected to use specialist CAD/CAM techniques with skill, control and understanding to produce a variety of outcomes within the assignment.

M2 requires learners to apply an individual approach to structuring and presenting a coherent, in-depth analysis of the benefits and limitations of current technological developments. For both merit criteria, learners will be able to demonstrate a greater understanding and knowledge of and skill in using specialist CAD/CAM applications and techniques, and 'quick response' systems.

For D1, learners will be able to use specialist CAD/CAM techniques with skill, discrimination, control and understanding.

For D2, an in-depth analysis of current technological developments should be expressed and presented in a professionally presented report.

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 M1 D1	**Assignment 1**: Fashion Presentation	Designer researches fashion magazines and front cover layouts. They will design and produce a magazine cover incorporating their own fashion drawing using specified CAD applications and techniques.	Portfolio of evidence consisting of: • research • design ideas and layouts • finished design • report • presentation (recorded).
P2, P3 M2 D2	**Assignment 2**: Production File	Designer produces technical folder/disk to create sample production and manufacturing techniques using a range of industry 3D software and related applications.	Portfolio of evidence consisting of: • production file/disk • report • presentation (recorded).
P1, P2, P3 M1, M2 D1, D2	**Assignment 3**: Technologies and the Fashion Industry	Designer conducts research on processes and related technologies used by a high street retailer, and their supply chain from design to the consumer.	Portfolio of evidence consisting of: • research • word-processed and visual report • presentation (recorded).

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
An Accessory Project	Working with Fashion Design Briefs	Pattern Construction for Fashion and Clothing
Introduction to Creative Use of Computers	Working with Digital Art and Design Briefs	Pattern Development for Fashion and Clothing
		Pattern Grading for Fashion and Clothing
		Production Techniques for Fashion and Clothing

National Occupational Standards

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

CCSkills Sector Skills Council

Design (revisions in draft form June 2009)

- DES2 Apply design industry knowledge to inform your own design work practice and work
- DES7 Contribute to the production of prototypes, models, mock-ups, samples or test pieces
- DES9 Research, test and apply techniques for the design of products
- DES23 Create 2D Designs using a Computer Aided Design System
- DES24 Create 3D Models using a Computer Aided Design System
- DES36 Develop and extend your design skills and practices.

Essential resources

Resources should include computer facilities for formal teaching, demonstrations and learner drop-in access. These facilities should have up-to-date educational and fashion industry standard hardware and software applications, Adobe Photoshop and Illustrator, Gerber, Lectra, Assyst and Investronica. Computer input (digitisers, colour scanners, digital cameras) and output (plotter and colour printer) devices should also be made available.

Learners should have access to library and information resources to enable them to achieve this unit. They should also have access to a range of digital resources and applications including the internet, CD ROMs and DVDs in order to achieve all learning outcomes.

Employer engagement and vocational contexts

Centres should develop links with local manufacturers and retail organisations. Suppliers of industry hardware and related software may also be willing to share and demonstrate the latest industry technologies and their benefits. Links with employers are essential to 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' to support the vocational content of the unit and programme.

Creative & Cultural Skills (www.ccskills.org.uk), the sector skills council for design have launched the web portal Creative Choices (www.creative-choices.co.uk). This portal has a range of information about careers in the design sector, including job descriptions.

Skillfast-UK, the sector skills council for fashion and textiles, provide details (www.skillfast-uk.org/justthejob) about careers advice and industry information, plus regularly updated news and events pages.

Indicative reading for learners

Textbooks

Aldrich W (editor) – *CAD in Clothing and Textiles* (Blackwell Science, 1994) ISBN 978-0632038930

Burke S – *Fashion Computing: Design Techniques and CAD* (Burke Publishing, 2006) ISBN 978-0958239134

Eberle Von H – *Clothing Technology* (Verlag Eropa-Lehrmittel, 4th Edition, 2004) ISBN 978-3808562246

Gray S – *CAD/CAM in Clothing and Textiles* (Gower Publishing, 1998) ISBN 978-0566076732

Gray S – *The Benefits of CAD Design and Manufacture: Clothing and Textiles* (Design Council, 1992) ISBN 978-0850723076

Taylor P – *Computers in the Fashion Industry* (Heinemann, 1990) ISBN 978-0434919161

Tyler D J – *Carr and Latham's Technology of Clothing Manufacture* (Wiley Blackwell, 2008) ISBN 978-1405161985

Websites

www.apparelmag.com	the website for Apparel magazine
www.apparelsearch.com/technology_clothing_industry.htm	directory for technology in the clothing industry
www.opitex.com	manufacturer of 2D/3D CAD/CAM fashion and textile design software
www.textile-training.com	Huddersfield based centre with production and training facilities

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	researching and explaining technological developments in the fashion industry
Creative thinkers	using CAD/CAM in a range of fashion functions
Reflective learners	reviewing and reflecting on the work produced, how this work could be developed and how the process/skills could be incorporated into other projects
Self-managers	organising time and use of resources to develop skills and produce outcomes
Effective participators	discussing benefits of technology within the fashion industry.

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	researching a range of fashion magazine covers and associated computer applications and techniques researching a high street retailer
Creative thinkers	designing and producing a cover for a fashion magazine using specific CAD software
Reflective learners	analysing findings
Self-managers	producing a folder/disk which demonstrates production and manufacturing techniques using a range of industry software managing self to complete work within specified timeframe
Effective participators	actively participating in presentations and group discussions.

Functional Skills – Level 2

Skill	When learners are ...
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	working on CAD/CAM packages producing word-processed reports and production files
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	
Manage information storage to enable efficient retrieval	
Follow and understand the need for safety and security practices	
Troubleshoot	
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	producing word-processed reports and production files
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	
ICT – Develop, present and communicate information	
Bring together information to suit content and purpose	explaining technologies used in design, manufacture and production
Present information in ways that are fit for purpose and audience	designing and producing a cover for a fashion magazine using specific CAD software
Evaluate the selection and use of ICT tools and facilities used to present information	producing a folder/disk which demonstrates production and manufacturing techniques using a range of industry software
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	emailing industry contacts for information and contact with tutor
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting work in a group situation participating in group discussions
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	researching and gathering information for word-processed reports and magazine layout
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	producing word-processed reports.