

BTEC Tech Awards in Digital Information Technology Programme of Study

This course is composed of 3 Components. Components 1 and 2 are assessed via non-exam internal assessment marked in school and moderated by Pearson. Pearson Set Assignments (PSAs) are issued twice a year. Component 3 is assessed via an externally assessed written exam.

Component 1 Exploring User Interface Design Principles and Project Planning Techniques

Component 2 Collecting, Presenting and Interpreting Data

Component 3 Effective Digital Working Practices

At SFA we complete Components 1 and 2 in Year 10 and Component 3 in Year 10 and sit the examination in Year 11.

| Component 1 | Component 2 | Component 3 |
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| <p>A1 User interfaces</p> <p>Learners will understand the use of different types of user interface and how they vary across different uses, devices and purposes.</p> <ul style="list-style-type: none">• Types of user interface:<ul style="list-style-type: none">o text basedo speech/natural languageo graphical user interface (GUI)/windows, icons, menus, pointer (WIMP)o sensorso menu/forms.• Range of uses and devices, to include:<ul style="list-style-type: none">o computerso handheld devices to include smartphones, tablets, laptops, e-readers | <p>A1 Characteristics of data and information</p> <p>Learners will understand the concepts of data and that data is meaningless without converting it into information by adding structure and context.</p> <ul style="list-style-type: none">• Characteristics of data:<ul style="list-style-type: none">o no meaningo no structureo no contexto unprocessed.• Characteristics of information:<ul style="list-style-type: none">o has meaningo has structureo has contexto is processed. <p>A2 Representing information</p> | <p>A1 Modern technologies</p> <p>Understand how and why modern technologies are used by organisations and stakeholders to access and manipulate data, and to provide access to systems and tools in order to complete tasks. Learners should understand the implications of these tools and technologies for organisations and stakeholders.</p> <ul style="list-style-type: none">• Communication technologies:<ul style="list-style-type: none">o setting up ad hoc networks (open Wi-Fi, tethering/personal hotspot)o security issues with open networks |

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| <ul style="list-style-type: none"> o entertainment systems to include games console, home theatre system o domestic appliances to include air conditioners, dishwashers, tumble dryers, freezers, washing machines, microwave ovens o controlling devices to include security lights, central heating controllers o embedded systems to include electronic parking meters, traffic lights, vending machines, smartwatches/digital wristwatches, robotic vacuum cleaners. ● Factors affecting the choice of user interface: <ul style="list-style-type: none"> o performance/response time o ease of use o user requirements o user experience o accessibility o storage space. ● Hardware and software influences: <ul style="list-style-type: none"> o operating systems/platforms o types/size of screen, to include touchscreen, traditional displays o types of user input, to include keyboard, mouse, voice, gestures o hardware resources available, to include processing power, memory o emerging technologies, to include new innovations of input techniques. | <p>Learners will understand the different ways of representing information and will be able to explain situations where they would be used.</p> <ul style="list-style-type: none"> ● Text ● Numbers ● Tables ● Graphs/charts ● Sparklines ● Infographics. <p>A3 Ensuring data is suitable for processing Learners will understand the methods that can be used to ensure data input is suitable and within boundaries so that it is ready to be processed.</p> <ul style="list-style-type: none"> ● Validation methods: <ul style="list-style-type: none"> o range check o type check o presence check o length check. ● Verification methods: <ul style="list-style-type: none"> o proofreading o double entry. <p>A4 Data collection Learners will understand the different types of data collection methods, the strengths</p> | <ul style="list-style-type: none"> o performance issues with ad hoc networks o issues affecting network availability (rural versus city locations, developed versus developing countries, available infrastructure, mobile network coverage, blackspots). ● Features and uses of cloud storage: <ul style="list-style-type: none"> o setting and sharing of access rights o synchronisation of cloud and individual devices o availability (24/7) o scalability (getting more by renting/freeing to save money). ● Features and uses of cloud computing: <ul style="list-style-type: none"> o online applications o consistency of version between users (features, file types) o single shared instance of a file o collaboration tools/features. ● How the selection of platforms and services impacts on the use of cloud technologies: <ul style="list-style-type: none"> o number and complexity of features o paid for versus free o interface design (layout, accessibility, mobile versus desktop) o available devices. |
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| <p>A2 Audience needs Learners will understand the varying needs of the audience and how they affect both the type and the design of the interface.</p> <ul style="list-style-type: none"> ● Accessibility needs: <ul style="list-style-type: none"> o visual o hearing o speech o motor o cognitive. <p>B2 Creating a project proposal and plan Learners will understand project planning techniques used to develop a project proposal and project plan for the development of a user interface for a given brief.</p> <p>Project proposal:</p> <ul style="list-style-type: none"> ● Purpose and audience. ● Project requirements: <ul style="list-style-type: none"> o user requirements o output requirements, to include visual, audio, haptic o input requirements, to include mouse, keyboard, voice, touch. ● User accessibility requirements. ● Constraints: <ul style="list-style-type: none"> o time o resources o task dependencies o security. <p>Project plan:</p> <ul style="list-style-type: none"> ● Timescales: | <p>and weaknesses of each, how data collection features affect its reliability and how the collection of data could be improved.</p> <ul style="list-style-type: none"> ● Data collection methods: <ul style="list-style-type: none"> o Primary data <ul style="list-style-type: none"> – interviews – questionnaires – surveys o Secondary data <ul style="list-style-type: none"> – websites – books – journals – blogs – forums – booking systems – company internal documents. ● Data collection features: <ul style="list-style-type: none"> o size of sample o who was in the sample o where the data was collected o when the data was collected o methods used. <p>A5 Quality of information Learners will understand the factors that affect the quality of information.</p> <ul style="list-style-type: none"> ● Quality of information factors: <ul style="list-style-type: none"> o source/collection method o accuracy o age | <ul style="list-style-type: none"> ● How cloud and ‘traditional’ systems are used together: <ul style="list-style-type: none"> o device synchronisation o online/offline working o notifications. ● Implications for organisations when choosing cloud technologies: <ul style="list-style-type: none"> o consideration of disaster recovery policies (service provider’s, organisation’s) o security of data (location, service provider’s security procedures and features) o compatibility o maintenance (software updates, downtime, staff expertise) o getting a service/storage up and running quickly o performance considerations (responsiveness to user, complexity of task, available devices and communication technologies). <p>A2 Impact of modern technologies Learners should understand how modern technologies impact on the way organisations perform tasks. Learners should understand how technologies are used to manage</p> |
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| <ul style="list-style-type: none"> o overall timescale o when tasks will be completed, including sub-tasks o key milestones. <p>B3 Creating an initial design Learners will understand how to produce an initial design using design principles.</p> <ul style="list-style-type: none"> ● Producing a design that meets: <ul style="list-style-type: none"> o the user requirements, including input and output requirements o user accessibility needs. ● Producing a design specification that includes: <ul style="list-style-type: none"> o visualisation, to include storyboards, sketches o hardware requirements o software requirements. ● Producing a design that allows for: <ul style="list-style-type: none"> o increased user confidence/familiarity o reduced learning time of new interfaces/features o reduced time to complete tasks o increased user attention o reduced need for specialised knowledge. <p>B4 Developing a user interface Learners will understand how to use their design to produce a user interface.</p> <ul style="list-style-type: none"> ● Initial design using the design principles listed in A3 Design principles. <p>C1 Review Learners will understand how to review the success of the user interface and the use of their chosen project planning techniques.</p> | <ul style="list-style-type: none"> o completeness o amount of detail o format/presentation o volume. <p>A6 Sectors that use data modelling Learners will understand how different types of data are used by organisations for data modelling.</p> <ul style="list-style-type: none"> ● Types of sectors, to include: <ul style="list-style-type: none"> o transport o education o retail o banking o entertainment government o health care o construction o communication o health and safety o sport and fitness. <p>A7 Threats to individuals Learners will understand the different threats that face individuals who have data stored about them.</p> <ul style="list-style-type: none"> ● Threats to individuals, to include: <ul style="list-style-type: none"> o invasion of privacy o fraud o targeting vulnerable groups of people o inaccurate data could be stored. | <p>teams, to enable stakeholders to access tools and services, and to communicate effectively. Learners should understand the positive and negative impact that the use of modern technologies has on organisations and stakeholders.</p> <ul style="list-style-type: none"> ● Changes to modern teams facilitated by modern technologies: <ul style="list-style-type: none"> o world teams (not bound by geographical restrictions, diversity) o multicultural o inclusivity (facilitation of member's needs) o 24/7/365 (no set work hours, team members in different time zones) o flexibility (remote working versus office based, permanent versus casual staff). ● How modern technologies can be used to manage modern teams: <ul style="list-style-type: none"> o collaboration tools o communication tools o scheduling and planning tools. ● How organisations use modern technologies to communicate with stakeholders: |
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| <ul style="list-style-type: none"> ● Strengths and weaknesses of the user interface, to include: <ul style="list-style-type: none"> o how well the user requirements have been met o suitability for purpose and audience o ease of use o accessibility features o how effectively the design principles have been met. ● Suggest improvements that could be made to the user interface to better meet the audience needs. | <p>Learning outcome B: Be able to create a dashboard using data manipulation tools</p> <p>B1 Data processing methods</p> <p>Learners will understand how data can be imported from an external source. They will then explore how to accurately apply data processing methods to aid decision making.</p> <p>These include:</p> <ul style="list-style-type: none"> ● data manipulation methods: <ul style="list-style-type: none"> o importing data, to include from other files, the internet o formulae, to include add, divide, subtract, multiply o functions, to include SUM, AVERAGE, MIN, MAX o sorting, to include sorting multiple columns and values. ● advanced manipulation methods: <ul style="list-style-type: none"> o decision-making functions, to include IF, WHATIF, SUMIF o lookup functions, to include VLOOKUP, HLOOKUP o count functions, to include COUNTBLANK, COUNTIF, COUNTA o logical operators, to include NOT, AND, OR o outline, to include group, ungroup | <ul style="list-style-type: none"> o communication platforms (website, social media, email, voice communication) o selection of appropriate communication channels (private/direct message, public status update) for sharing information, data and media. ● How modern technologies aid inclusivity and accessibility: <ul style="list-style-type: none"> o interface design (layout, font and colour selection) o accessibility features (screen reader support, alt text, adjustable typeface/font size, text to speech/'listen to this page') o flexibility of work hours and locations. ● Positive and negative impacts of modern technologies on organisations in terms of: <ul style="list-style-type: none"> o required infrastructure (communication technologies, devices, local and web-based platforms) o demand on infrastructure of chosen tools/platforms o availability of infrastructure o 24/7 access or security of distributed/disbursed data |
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| | <ul style="list-style-type: none"> o subtotal to include AVERAGE, SUM, MIN, MAX, COUNT, COUNTA o filtering, to include greater than, less than, equals, contains, begins with, ends with, text to columns, to include delimited, fixed width. ● other processing methods: <ul style="list-style-type: none"> o absolute and relative cell referencing, to include use of dollar sign (\$) and named cells o macros, to include for automatic navigation, change graph options, change data ranges o multiple and linking worksheets, to include for dashboard and raw data o cell comments o alternative views, to include hiding/unhiding cells, freezing planes o conditional formatting, to include data bars, colour scales, icon sets. B2 Producing a dashboard Learners will use a dashboard to select and display information summaries based on a given data set. ● Showing data summaries from the data set: <ul style="list-style-type: none"> o totals o counts o averages | <ul style="list-style-type: none"> o collaboration or inclusivity (age, health, additional needs, multicultural) o accessibility (meeting legal obligations, provision requirements) o remote working. ● Positive and negative impacts of modern technologies on individuals: <ul style="list-style-type: none"> o flexibility (home/remote working) o working styles (choice of time, device, location) o impact on individual's mental wellbeing (depression, loneliness, self-confidence, separation from stressful environment, feel in control of own schedule, schedule adjusted to meet needs of family, less time commuting). B1 Threats to data Learners should understand why systems are attacked, the nature of attacks and how they occur, and the potential impact of breaches in security on the organisation and stakeholders. ● Why systems are attacked: <ul style="list-style-type: none"> o fun/challenge o industrial espionage or financial gain |
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| | <ul style="list-style-type: none"> o percentages o sales breakdowns o departmental/section breakdown. ● Appropriate presentation methods: o tables o pivot tables o sparklines o graphs/charts, including dynamic charts/graphs o form controls, to include button, combo box, check box, spin button (spinner), dropdown menu, option button. ● Using appropriate presentation features: o font size, style and colour o merge cells o text wrap o cell borders and shading o graphics o axis labels o titles, including overall and section titles o conditional formatting. <p>Learning outcome C: Be able to draw conclusions and review data presentation methods</p> <p>C1 Drawing conclusions based on findings in the data</p> <p>Learners will use a dataset and dashboard to present findings and draw conclusions based on their findings.</p> <ul style="list-style-type: none"> ● Findings, to include: | <ul style="list-style-type: none"> o personal attack o disruption o data/information theft. ● External threats (threats outside the organisation) to digital systems and data security: o unauthorised access/hacking (black hat) o malware (virus, worms, botnet, rootkit, Trojan, ransomware, spyware) o denial of service attacks or phishing (emails, texts, phone calls) o pharming o social engineering o shoulder surfing o 'man-in-the-middle' attacks. ● Internal threats (threats within the organisation) to digital systems and data security: o unintentional disclosure of data o intentional stealing or leaking of information o users overriding security controls o use of portable storage devices o downloads from internet o visiting untrustworthy websites. ● Impact of security breach: o data loss o damage to public image o financial loss |
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| | <ul style="list-style-type: none"> o trends o patterns o possible errors. <p>C2 How presentation affects understanding Learners will investigate how well the presentation methods and features listed in B2 have been used, to ensure they do not lead to:</p> <ul style="list-style-type: none"> ● information being misinterpreted ● information being biased ● inaccurate conclusions being made. | <ul style="list-style-type: none"> o reduction in productivity o downtime o legal action. <p>B2 Prevention and management of threats to data Learners should understand how different measures can be implemented to protect digital systems. They should understand the purpose of different systems and how their features and functionality protect digital systems. Learners should understand how one or more systems or procedures can be used to reduce the nature and/or impact of threats.</p> <ul style="list-style-type: none"> ● User access restriction: <ul style="list-style-type: none"> o physical security measures (locks) o passwords o using correct settings and levels of permitted access o biometrics o two-factor authentication (who you are, what you know, what you have). ● Data level protection: <ul style="list-style-type: none"> o firewall (hardware and software) |
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| | | <ul style="list-style-type: none"> o software/interface design (obscuring data entry, autocomplete, 'stay logged in') o anti-virus software o device hardening o procedures for backing up and recovering data o encryption of stored data (individual files, drive) o encryption of transmitted data. ● Finding weaknesses and improving system security: <ul style="list-style-type: none"> o ethical hacking (white hat, grey hat) o penetration testing o analyse system data/behaviours to identify potential risks. <p>B3 Policy</p> <p>Learners should understand the need for and nature of security policies in organisations. They should understand the content that constitutes a good security policy and how it is communicated to individuals in an organisation. To ensure that potential threats and the impact of security breaches are minimised, learners should</p> |
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| | | <p>understand how procedures in security policies are implemented in organisations.</p> <ul style="list-style-type: none">● Defining responsibilities:<ul style="list-style-type: none">o who is responsible for whato how to report concernso reporting to staff/employees.● Defining security parameters:<ul style="list-style-type: none">o password policyo acceptable software/installation/usage policyo parameters for device hardening.● Disaster recovery policy:<ul style="list-style-type: none">o who is responsible for whato dos and don'ts for staffo defining the backup process (what is backed up, scheduling, media)o timeline for data recoveryo location alternative provision (hardware, software, personnel).● Actions to take after an attack:<ul style="list-style-type: none">o investigate (establish severity and nature)o respond (inform/update stakeholders and appropriate authorities)o manage (containment, procedures appropriate to nature and severity)o recover (implement disaster recovery plan, remedial action) |
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| | | <p>o analyse (update policy and procedures).</p> <p>C The wider implications of digital systems</p> <p>Learners should understand the wider implications of digital systems and their use.</p> <p>Learners should understand how legislation covering data protection, computer crimes and intellectual property has an impact on the way that organisations and individuals use digital systems and data. Learners should understand the procedures that organisations must follow in order to conform to legal requirements and professional guidelines.</p> <p>C1 Responsible use</p> <p>Learners should consider the responsible use of digital systems, including how systems and services share and exchange data as well as the environmental considerations of increased use.</p> <ul style="list-style-type: none"> ● Shared data (location-based data, transactional data, cookies, data exchange |
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| | | <p>between services):</p> <ul style="list-style-type: none"> o benefits of using shared data o drawbacks of using shared data o responsible use (legal considerations, privacy, ethical use). <p>● Environmental:</p> <ul style="list-style-type: none"> o impact of manufacturing, use, and disposal of IT systems (energy, waste, rare materials) o considerations when upgrading or replacing digital systems o usage and settings policies (auto power off, power-saving settings, hard copy versus electronic distribution). <p>C2 Legal and ethical</p> <p>Learners should understand the scope and purpose of legislation (valid at time of delivery) that governs the use of digital systems and data, and how it has an impact on the ways in which organisations use and implement digital systems.</p> <p>Learners should understand the wider ethical considerations of use of technologies, data and</p> |
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| | | <p>information, and organisations' responsibilities to ensure that they behave in an ethical manner.</p> <ul style="list-style-type: none">● Importance of providing equal access to services and information:<ul style="list-style-type: none">o benefits to organisations, individuals and societyo legal requirementso professional guidelines/accepted standards.● Net neutrality and how it impacts on organisations.● The purpose and use of acceptable use policies:<ul style="list-style-type: none">o scope – who the document applies too assets – the equipment, documents, and knowledge covered by the policyo acceptable – behaviours that are expected/required by an organisationo unacceptable – behaviours that are not allowed by an organisationo monitoring – description of how behaviour is monitored by an organisationo sanctions – defining the processes and potential sanctions if unacceptable behaviour occurs |
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| | | <ul style="list-style-type: none"> o agreement – acknowledge (sign, click) that an individual agrees to abide by the policy. ● Blurring of social and business boundaries: <ul style="list-style-type: none"> o use of social media for business purposes o impact of personal use of digital systems (social media, web) on professional life. ● Data protection principles: <ul style="list-style-type: none"> o lawful processing o collected only for specific purpose o only needed information is collected o should be accurate o kept only as long as is necessary o data subject rights o protected o data subject rights not transferred to countries with less protection. ● Data and the use of the internet: <ul style="list-style-type: none"> o the right to be forgotten o appropriate and legal use of cookies and other transactional data. ● Dealing with intellectual property: <ul style="list-style-type: none"> o the importance of intellectual property in organisations o methods of identifying/protecting intellectual property (trademarks, |
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| | | <p>patents copyright)</p> <ul style="list-style-type: none"> o legal and ethical use of intellectual property (permissions, licensing, attribution). ● The criminal use of computer systems: <ul style="list-style-type: none"> o unauthorised access o unauthorised modification of materials o creation of malware o intentional spreading of malware. <p>D Planning and communication in digital systems</p> <p>Learners should be able to interpret and use standard conventions to combine diagrammatical and written information to express an understanding of concepts.</p> <p>D1 Forms of notation</p> <ul style="list-style-type: none"> ● Understand how organisations use different forms of notation to explain systems, data and information: <ul style="list-style-type: none"> o data flow diagrams o flowcharts o system diagrams o tables o written information. |
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| | | <ul style="list-style-type: none"> ● Be able to interpret information presented using different forms of notation in a range of contexts. ● Be able to present knowledge and understanding using different forms of notations: <ul style="list-style-type: none"> o data flow diagrams o information flow diagrams o flowcharts. |
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