Curriculum Knowledge Map

CHS Computing and Technology 2022/2023

PEARSON BTEC Tech Award ½ in Digital Information Technology

Component 1: Exploring User Interface Design Principles and Project Planning Techniques	Component 2: Collecting, Presenting and Interpreting Data	Component 3: Effective Digital Working Practices
Learners will develop their understanding of what makes an effective user interface and how to effectively manage a project. They will use this understanding to plan, design and create a user interface. **Learning outcomes** ✓ Understand interface design for individuals and organisations ✓ Be able to use project planning techniques to plan, design and develop a user interface ✓ Be able to review a user interface	Learners will understand the characteristics of data and information and how they help organisations in decision making. They will use data manipulation methods to create a dashboard to present and draw conclusions from information. **Learning outcomes** ✓ Understand how data is collected and used by organisations and its impact on individuals ✓ Be able to create a dashboard using data manipulation tools ✓ Be able draw conclusions and review data presentation methods.	Learners will explore how organisations use digital systems and the wider implications associated with their use. **Learning Aims:** **A. Modern Technologies** **B. Cyber Security** **C. The Wider Implications of Digital Systems** **D. Planning & Communication in Digital Systems**
Components 1 and 2 are assessed through non-exam internal assessment. The non-exam internal assessment for these components has been designed to demonstrate application of the conceptual knowledge underpinning the sector through realistic tasks and activities. This style of assessment promotes deep learning through ensuring the connection between knowledge and practice. • Non-exam internal assessment set by • Pearson, marked by the centre and • moderated by Pearson. • The Pearson-set Assignment will be • completed in approximately 6 hours of • supervised assessment. • 60 marks.		External assessment set and marked by Pearson, completed under supervised conditions. The assessment will be completed in 1 hour 30 minutes within the period timetabled by Pearson. 60 marks.

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PEARSON BTEC Tech Award ½ in Digital Information Technology

Year 10

Year 10	AUTUMN		SPRING		SUMMER	
	Component 1	**Component 1**	**C1 Coursework**	**C3 Theory**	**C3 Theory**	**C2 Theory**
	Learning outcome A: Understand interface design for individuals and organisations	**Learning outcome B:** Be able to use project planning techniques to plan, design and develop a user interface	During this half term students will undertake coursework (NEA) activities that contribute to 30% of their final grade.	Learners will explore how organisations use digital systems and the wider implications associated with their use. **Modern Technologies & Cyber Security**	Implications of Digital Systems & Planning and communication	**Learning outcome A:** Understand how data is collected by organisations and its impact on individuals
Declarative *What should they know? 'to know that' the facts, concepts, rules. It just sits there and waits to be of service*	**A1 User interfaces** Learners will understand the use of different types of user interface and how they vary across different uses, devices, and purposes. • Types of user interface • Range of uses and devices. • Factors affecting the choice of user interface • Hardware and software influences **A2 Audience Needs** Understand the varying needs of the audience and how they affect both the type and the design of the interface • Accessibility needs • Skill Level • Demographics	**B1 Project Planning Techniques** Understand the use of different planning tools and design methodologies that can be used to plan, monitor, and execute projects. <u>Planning Tools</u> • Task list • Written/ Graphical descriptions • Gantt Charts • Mood boards • Mind maps <u>Methodologies</u> • Waterfall • Agile • Scrum **B2 Creating a project proposal and plan.** Understand project planning techniques used to develop a	Autumn term allowed students to develop their knowledge and understanding of what makes an effective user interface and how to effectively manage a project. They will now use this understanding to plan, design and create a user interface. *Non-exam internal assessment set by Pearson, marked by the centre and moderated by Pearson. The Pearson-set Assignment will be completed in approximately 6 hours of supervised assessment. 60 marks.*	**A1 Modern technologies** Understand how and why modern technologies are used by organisations and stakeholders alongside the implications of these tools and technologies. • Communication technologies: • Features and uses of cloud storage: • Features and uses of cloud computing: • How the selection of platforms and services impacts on the use of cloud technologies: • How cloud and 'traditional' systems are used together: • Implications for organisations when	**C Wider implications of digital systems** **C1 Responsible Use** • Shared data (location based, transactional, cookies, data exchanged between services) • Environmental **C2 Legal and ethical** • Importance of providing equal access to services and information • Net neutrality and how it impacts organisations • The purpose and use of acceptable use policies • Blurring of social and business boundaries	**A1 Characteristics of Data and Information** Learners will understand the concepts of data and that data is meaningless without converting it into information by adding structure and context. • **Characteristics of Data** • **Characteristics of Information** **A2 Representing Information** Learners will understand the different ways of representing information and will be able o explain situations where they would be used. • Text • Numbers • Tables • Graphs/Charts • Sparklines

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	A3 Design principles
	How design principles provide both appropriate and effective user interaction with hardware devices
	• Colours
	• Font style/size
	• Language
	• Amount of information
	• Layout
	• User perception
	• Retaining User attention
	• Intuitive design
	A4 Designing an efficient user interface
	Understand the techniques that can be used to improve both the speed and access to user interfaces
	• Keyboard shortcuts
	• Informative feedback
	• Reversal of actions
	• Distinguishable links/buttons
	• Objects to influence selection/ stand out/ placement.
		project proposal and project plan for the development of a suer interface for a given brief
		<u>Project Proposal</u>
		• Purpose and audience
		• Project requirements
		  ○ User
		  ○ Output/Input
		• Accessibility Requirements
		• Constraints
		  ○ Time
		  ○ Resources
		  ○ Dependencies
		  ○ Security
		<u>Project Plan:</u>
		Timescales:
		• Overall
		• Sub-tasks
		• Key Milestones
				choosing cloud technologies:
				A2 Impact of modern technologies
				Learners should understand how modern technologies impact on the way organisations perform tasks.
				• Changes to modern teams facilitated by modern technologies:
				• How modern technologies can be used to manage modern teams:
				• How organisations use modern technologies to communicate with stakeholders:
				• How modern technologies aid inclusivity and accessibility:
				• Positive and negative impacts of modern technologies
				• Positive and negative impacts of modern technologies on individuals:
				B Cyber security
				B1 Threats to Data
				• Why systems are attacked
				• External threats to digital systems and data security
					• Data protection principles
					• Data and the use of the internet
					• Dealing with intellectual property
					• The criminal use of computer systems
					D Planning & Communication in digital systems
					D1 Forms of Notation
					• Understanding how organisations use different forms of notation to explain systems, data and information:
					  ○ Data flow diagrams
					  ○ Flowcharts
					  ○ System diagrams
					  ○ Tables
					  ○ Written information
					• 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
						• Infographics
						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.
						• Validation Methods
						  ○ Range
						  ○ Type
						  ○ Presence
						  ○ Length
						• Verification Methods
						  ○ Proofreading
						  ○ Double entry
						A4 Data Collection
						Learners will understand the factors that affect the quality of information.
						• Quality of information factors:
						  o source/collection method
						  o accuracy
						  o age
						  o completeness
						  o amount of detail
						  o format/presentation
						  o volume.
						  A5 Quality of Information
						A6 Sectors that use Data modelling
						Learners will understand how different types of data are used by organisations for data modelling.

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				• Internal threats to digital systems & data security • Impacts of security breaches **B2 Prevention and management of threats to data** • User access restriction • Data level protection • Finding weaknesses and improving system security **B3 Policy** • Defining responsibilities • Defining security parameters • Disaster recovery policy • Actions to take after an attack		• Types of sectors, to include: o transport o education o retail o banking o entertainment **A7 Threats to individuals** Learners will understand the different threats that face individuals who have data stored about them. • Threats to individuals, to include: o invasion of privacy o fraud o targeting vulnerable groups of people o inaccurate data could be stored.
Procedural *What should they be able to do?* *'to know how to' produces action, how to perform the steps in a process*	• Learners will understand the use of different types of user interface and how they vary across different uses, devices, and purposes. • Understand the varying needs of the audience and how they affect both the type and the design of the interface • Understand how design principles provide both appropriate and effective user interaction with hardware devices	**B3 Creating an initial design** Learners will understand how to produce an initial design using design principles. **<u>Producing a design that meets:</u>** the user requirements, including input and output requirements o user accessibility needs. <u>Producing a design specification that includes:</u> o visualisation, to include storyboards, sketches o hardware requirements o software requirements. **<u>Producing a design that allows for:</u>**	**Task 1: Project Proposal** • Complete a project proposal template through analysis of a project brief. • Consider the purpose and audience of a project brief, as well as project requirements, user accessibility needs and constraints. • Use software to create a project plan using project planning and design methodologies taking into consideration	Students should be able to: • Analyse information in a range of vocational contexts so that students develop a greater understanding of the use of digital systems by organisations and so that they can make reasoned judgements on the systems. • Demonstrate knowledge of facts, terms, processes and issues in relation to digital information technology • Demonstrate an understanding of facts, terms, processes and issues in relation to digital information technology • Apply an understanding of facts, terms, processes and issues in relation to digital information technology • Make connections with the concepts, issues, terms and processes in digital information technology • 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		• Learners will understand the concepts of data and that data is meaningless without converting it into information by adding structure and context. • Learners will understand the different ways of representing information and will be able o explain situations where they would be used. • 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.

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	• Understand the techniques that can be used to improve both the speed and access to user interfaces	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. **B4 Developing a user interface** Learners will understand how to use their design to produce a user interface. ● Initial design using the design principles listed in A3 Design principles.	project proposal brief and overall timescales for the project. **Task 2: Interface Designs** • Design an initial user interface for four screens of a user interface that meets user requirements and user accessibility needs and other specific hardware and software needs and design considerations. **Task 3: Prototype User Interface** • Use initial designs to develop a working prototype of four screens that meets requirements and user accessibility needs. **Task 4: Review** • Review their user interface and project planning techniques against a set of criteria: o User requirements o Ease of use o Design principles o Accessibility features • Suggest improvements to		Learners will understand the factors that affect the quality of information. Learners will understand how different types of data are used by organisations for data modelling. Learners will understand the different threats that face individuals who have data stored about them. •

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			better meet audience needs.			
Disciplinary Literacy (Tier 3 Vocab)	Tier 3 Disciplinary literacy linked to the unit of study: • User Interface • GUI • WIMP • Sensors • Device • Embedded Systems • Performance/Response Time • User Requirements • User Experience • User Accessibility • Operating Systems • Platforms • Memory • Processing • Emerging Technologies • Innovative • Motor • Cognitive • Skill Levels • Demographics • House Style • Serif / Sans Serif • White Space • Layout • Consistency • Breadcrumbs • Icons • Input • Output • Perception • Intuitive	Tier 3 Disciplinary literacy linked to the unit of study: • Gantt Chart • Mood Board • Mind map • Methodology • Waterfall • Agile • Scrum • Project Brief • Project Requirements • User Requirements • Input/Output Requirements • Accessibility Requirements • Constraints • Timescales • Sub-tasks • Milestones • Storyboard •	Tier 3 Disciplinary literacy linked to the unit of study: • Success Criteria • Limited • Adequate • Good • Comprehensive • Superficial • Partially • Mostly • Fully • Assignment Brief • Application	Tier 3 Disciplinary literacy linked to the unit of study: • Ad-hoc • Open Wi-Fi • Tethering • Hotspot • Rural • Infrastructure • Blackspots • Access rights • Cloud storage • Synchronization • 24/7/365 • Scalability • Applications • Collaboration • Online/offline • Disaster Recovery • Policies • Compatibility • Maintenance • World Teams • Multicultural • Inclusivity • Flexibility • Scheduling • Remote Working • unintentional disclosure • information theft • security controls • security breach • internal threat • password • access levels • biometrics	Tier 3 Disciplinary literacy linked to the unit of study: • Shared data • location-based data • GPS • transactional data • cookies • data exchange • privacy • ethics • manufacture • disposal • energy • waste • rare materials • upgrade • replace • policy settings • auto power off • power-saving • equal access • equality • net neutrality • acceptable use policies • scope • assets • monitoring • sanctions • social media • professional life • data protection • lawful processing • accuracy • data subject • right to be forgotten • trademarks	Tier 3 Disciplinary literacy linked to the unit of study: • Characteristics • Context • Structure • Data • Information • Table • Graphs/Charts • Sparkline • Infographic • Validation • Verification • Primary Data • Secondary Data • Sample • Privacy • Fraud

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				• two-factor authentication • ethical hacking • penetration testing • system analysis • firewall • interface design • autocomplete • anti-virus • device hardening • encryption • cyber security • policy • acceptable use policy (AUP) • disaster recovery • backups	• patents • copyright • permissions • licensing • attribution • unauthorized access • unauthorized modification • malware • Data flow diagram • Information flow diagram • System diagram • Flowchart • Input • Output • Process • Decision • Variable • Chart • Range • Maximum • Minimum • Data • Information • Table •	
Assessment	**Key assessed piece** End of topic assessment – User Interfaces & Design Principles Students will complete a summative assessment linked to the topics covered.	**Key assessed piece** Progress Test Assessment: Students will be assessed on their knowledge and understanding of both User Interfaces & Project Planning.	**Key assessed piece** Coursework progress (Component 1) – this coursework piece will be formally assessed to allow for feedback and improvements to be made based on the first elements of the task. *Total marks for this piece of coursework is 60.*	**Key assessed piece** End of topic assessment – Modern Technologies & Cyber Security Students will complete a summative assessment linked to the topics covered.	**Key assessed piece** End of topic assessment – Impact of Modern Technologies & Planning & Communication Students will complete a summative assessment linked to the topics covered.	**Key assessed piece** End of topic assessment – Data & Information / Representing information & Data collection Methods. Students will complete a summative assessment linked to the topics covered.

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Year 11

<table>
<tr><th>Year 11</th><th colspan="2">AUTUMN</th><th colspan="2">SPRING</th><th colspan="2">SUMMER</th></tr>
<tr><td></td><td>C2 Theory</td><td>C2 Coursework</td><td>Unit Name</td><td>Unit Name</td><td>Unit Name</td><td>Unit Name</td></tr>
<tr><td></td><td>Be able to create a dashboard using data manipulation tools</td><td></td><td>Enterprise and Marketing Concepts (RO67 External Exam)</td><td>Enterprise and Marketing Concepts (RO67 External Exam)</td><td>Enterprise and Marketing Concepts (RO67 External Exam)</td><td></td></tr>
<tr><td></td><td rowspan="2">B1 Data Processing Methods
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.
These include:
● data manipulation methods:
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.</td><td rowspan="2">During the Summer 2 and Autumn 1 term, students developed their knowledge and understanding of the characteristics of data and information and how they help organisations in decision making. They then explored data manipulation methods used to create dashboards in order to present and draw conclusions from information.
Non-exam internal assessment set by Pearson, marked by the centre and moderated by Pearson. The Pearson-set Assignment will be completed in approximately 6 hours of</td><td colspan="2">Continuation of Coursework Task carrying on from Autumn 2.
Following on from this, students will prepare for their final assessment for Component 3 worth 40%.</td><td colspan="2">During this half term students will prepare for their final assessment for RO67. As students can take this assessment twice, this will be preparation for a re-sit attempt. This assessment is worth 40% of their final grade.
Students will also review coursework pieces assigned to them so make sure these are ready for submission.</td><td rowspan="2"></td></tr>
<tr><td>Declarative
What should they know?</td><td colspan="4">Component 3 Theory and Assessment Preparation.
Students should know the content covered within Spring 2 and Summer 1 of Year 10, as an overview, students should have thorough understanding and knowledge in the below areas:
A Modern technologies
Learners should understand how current and modern technologies are used by and have an impact on organisations and their stakeholders. Learners need to know the ways in which organisations and associated individuals use modern technologies to exchange information, communicate, and complete work-related tasks. Learners must be able to apply their knowledge to a range of vocational contexts.
B Cyber security
Students must understand how the increased reliance of organisations on digital systems to hold data and perform vital functions presents a range of challenges and dangers. They should understand the nature of threats to digital systems and ways that they can be mitigated through organisation policy, procedures, and the actions of individuals. They should be able to apply knowledge of cyber security to a range of vocational contexts.
C The wider implications of digital systems
Learners should understand the wider implications of digital systems and their use. Learners should understand how legislation covering data protection, computer crimes</td></tr>
</table>

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	● advanced manipulation methods: 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 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: 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	*supervised assessment. 60 marks.*	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. **D Planning and communication in digital systems** Learners should be able to interpret and use standard conventions to combine diagrammatical and written information to express an understanding of concepts.	

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	o cell comments o alternative views, to include hiding/unhiding cells, freezing planes o conditional formatting, to include data bars, colour scales, icon sets			
Procedural *What should they be able to do?*	**B2 Producing a dashboard** Learners will use a dashboard to select and display information summaries based on a given data set. ● Show data summaries from data sets: o totals o counts o averages o percentages o sales breakdowns o departmental/section breakdown. ● Use and produce 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. ● Use 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 **C1 Drawing conclusions based on findings in the data**		Component 3 builds on knowledge, understanding and skills acquired and developed across the qualification. It requires learners to select and integrate knowledge and understanding synoptically from all components. Students are required to apply their knowledge and understanding to given scenarios or contexts. Students should be able to: • Analyse information in a range of vocational contexts so that students develop a greater understanding of the use of digital systems by organisations and so that they can make reasoned judgements on the systems. • Demonstrate knowledge of facts, terms, processes and issues in relation to digital information technology • Demonstrate an understanding of facts, terms, processes and issues in relation to digital information technology • Apply an understanding of facts, terms, processes and issues in relation to digital information technology • Make connections with the concepts, issues, terms and processes in digital information technology • 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 **To be successful within the external component and assessment, students should be able to:** • **Annotate** - Identify and label the diagram and state what each feature /process /characteristic is for, their purpose, etc. • **Describe** - Present two (or more) linked descriptive points on characteristics, features, uses or processes. Do not need to include a justification or reason. • **Discuss** - Consider the different aspects in detail of an issue, situation, problem or argument and how they interrelate. • **Draw** – Produce a diagram or process flow using information from the given context. • **Evaluate** - Consider various aspects of a subject's qualities in relation to its context such as: strengths and weaknesses, advantages and disadvantages, pros and cons. Come to a judgement supported by evidence which will often be in the form of a conclusion. • **Explain** – Present one point that identifies a reason, way, benefit, or importance, etc. and a second point that justifies/explains the first point. Where used, a third point is a further expansion of the justification/explanation. • **Give** - Provide a response, i.e. feature, characteristic or use of. • **Identify** - Select the correct answer from the given context.	

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	Learners will use a dataset and dashboard to present findings and draw conclusions based on their findings. ● Findings, to include: o trends o patterns o possible errors. **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: ● information being misinterpreted ● information being biased ● inaccurate conclusions being made. **Coursework Tasks.** • In response to Task 1, learners will explore the suitability of two given data collection methods used by an organisation for a given dataset. • In response to Task 2, learners will carry out different manipulation and processing methods in order to create a dashboard, providing data summaries using appropriate presentation methods and features. • In response to Task 3, learners will analyse a dataset, present their findings and draw conclusions based on these findings. They will explore how presentation affects understanding in the dataset and how they could be improved.		• **State** - Recall from memory facts, terms, processes, legal implications, etc. or provide the correct answer to the given context.					
Disciplinary Literacy (Tier 3 Vocab)	Tier 3 Disciplinary literacy linked to the unit of study: • Invasion of Privacy • Fraud • Vulnerable • Manipulation • Import • Formulae • Functions • SUM • AVERAGE	Tier 3 Disciplinary literacy linked to the unit of study: • Dashboard • Summary • Data set • Sales Breakdown • Pivot Tables • Spreadsheet • Table • Sheet • Cell Referencing • Conclusion	• Ad-hoc • Open Wi-Fi • Tethering • Hotspot • Rural • Infrastructure • Blackspots • Access rights • Cloud storage • Synchronization • 24/7/365 • Scalability	• information theft • security controls • security breach • internal threat • password • access levels • biometrics • two-factor authentication • ethical hacking	• Shared data • location-based data • GPS • transactional data • cookies • data exchange • privacy • ethics • manufacture • disposal	• acceptable use policies • scope • assets • monitoring • sanctions • social media • professional life • data protection	• malware • Data flow diagram • Information flow diagram • System diagram • Flowchart • Input • Output • Process	**Command Words**

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	• Cell • Macro	• Trends • Patterns • Errors • Misinterpreted • Biased	• Applications • Collaboration • Online/offline • Disaster Recovery • Policies • Compatibility • Maintenance • World Teams • Multicultural • Inclusivity • Flexibility • Scheduling • Remote Working • unintentional disclosure	• penetration testing • system analysis • firewall • interface design • autocomplete • anti-virus • device hardening • encryption • cyber security • policy • acceptable use policy (AUP) • disaster recovery • backups	• energy • waste • rare materials • upgrade • replace • policy settings • auto power off • power-saving • equal access • equality • net neutrality	• lawful processing • accuracy • data subject • right to be forgotten • trademarks • patents • copyright • permissions • licensing • attribution • unauthorized access • unauthorized modification	• Decision • Variable • Chart • Range • Maximum • Minimum • Data • Information • Table	
Assessment	**Key assessed piece** Baseline /End of topic assessment – Data Manipulation Methods. Students will complete a summative assessment linked to the topics covered.	**Key assessed piece** Coursework progress (RO69) – this coursework piece will be formally assessed to allow for feedback and improvements to be made based on the first elements of the task. *Total marks for this piece of coursework is 60.*	**Key assessed piece** Students will complete their first attempt at the external examination set by Pearson. This will assess all elements of Component 3.	**Key assessed piece** Students will have focused assessment practice during this half term. Students assessment tasks will either; • Look at methods of developing or improving coursework tasks • Support progress and development for external assessment tasks.	**Key assessed piece** Students will complete their second attempt at the external examination set by Pearson (if appropriate). This will assess all elements of Component 3			