

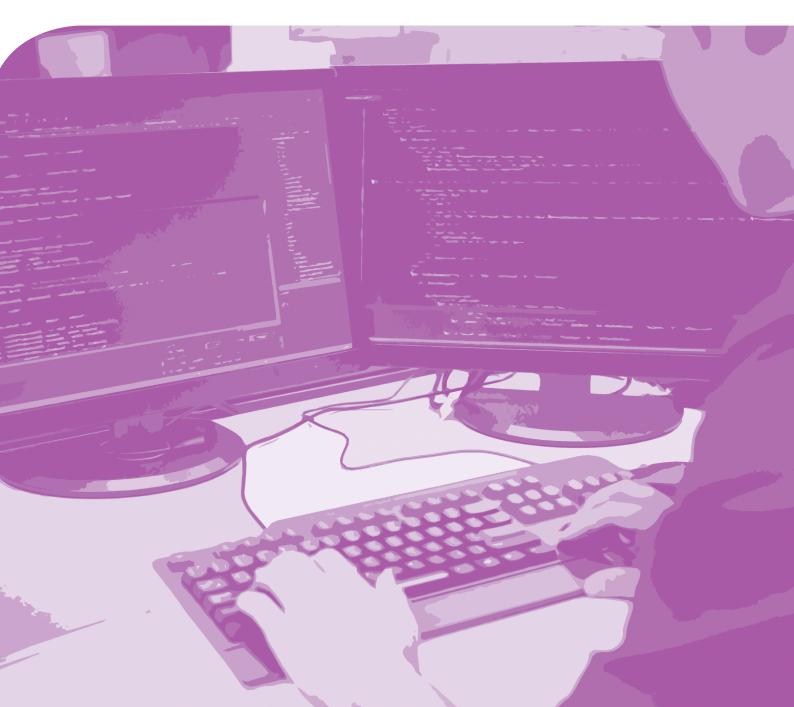
Pearson BTEC Uzbekistan Level 4 Qualifications in

Software Development

Unit 10: Software Design and Development Project

Teacher Resources

Issue 1



Edexcel, BTEC and LCCI qualifications

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Introduction

This resource booklet is a companion to the BTEC Uzbekistan Level 4 Qualifications in Software Development. The specification tells you what must be taught and what must be assessed. This resource booklet gives you suggestions and ideas as to how you can do this.

This booklet gives you ideas for teaching and learning, including practical activities, realistic scenarios, ways of involving employers in delivery and of managing independent learning, and how to approach assessments. The booklet also shows you how the specification content might work in practice and inspires you to start thinking about different ways of delivering your qualification.

This resource booklet gives you:

- guidance on how to deliver the unit
- recommended resources to support the delivery of the unit
- a scheme of work that show the topics, activities and assessments covered in the unit
- lesson plans with detailed guidance on how to deliver the lessons in the unit

The information in this resource booklet has been put together by teachers who have been close to the development of the qualification and so understand the challenges of finding new and engaging ways to deliver BTEC qualifications.

The delivery guidance in this booklet gives you information on what you need to consider as you plan the delivery of the unit. This includes suggestions on how to approach the learning aims and unit content, as well as ideas for interesting and varied activities. You will also find tips and ideas on how to plan for and deliver your assessments.

We have included a list of carefully selected resources for the unit. This resource list offers suggestions for books, websites and videos that you can direct your learners to use and/or that you can use to complement delivery.

Unit 10: Software Design and Development Project

Delivery guidance

Approaching the unit

In this unit learners take on the role of project manager, managing a software design and development project that is based on one of the units they have already studied.

There are two other stakeholders who must be involved in the project: the senior manager and the client. The teacher will take on the role of senior manager. To play the role of client, it may be possible to find an employer to take on this role. However, if no external person is available, then a teacher will also need to take on the role of client. This might be the same teacher who plays the role of senior manager or a different teacher.

It is vital that teacher and learner can differentiate between teacher in their normal teaching role, the teacher in the role of senior manager and (if applicable) the teacher in the role of client. A good method of making this distinction clear is to set up different email accounts for the senior manager and client. Learners will then be clear about with whom they are communicating , and the teacher can be clear about who they are communicating as.

Very few formal teaching lessons will take place during the course of this unit. It is expected to reflect a more 'real-life experience' where employees would be expected to communicate with their colleagues and external stakeholders in a professional manner and manage their time effectively. A lot of the teacher's time will be spent in meetings with learners in the role of senior manager and client. When not in meetings, teacher's role will be to monitor progress, provide encouragement and feedback and intervene if there is a danger of the project not being completed on time.

There are five different client briefs learners can base their project upon. These are based on units they have already completed. It is vital that learners choose a project brief that will a) interest them and b) match their skill set. Before starting the project, learners should be given time to discuss the briefs with their peers and with the teacher and to carry out independent research into skills they may need. The briefs have been purposely written so that learners need to enhance and deepen the skills gained in the previous units. This reflects real-life situations where software developers will not always know the answers and will have to develop or enhance their skills before they begin a project. Their peers should become very important to them as a source of knowledge and advice.

Learning aim A

Before beginning Learning aim A, the teacher will have agreed the brief for each learner, and learners will have carried out independent research into the skills they will need to acquire in order to complete it.

The teacher will also have spent a short time recapping the project management skills covered in Unit 9. For this project, learners may choose to use any project management methodology in order to plan and monitor the project (e.g. Waterfall, Agile, etc.). It is important learners have decided on this before they create the initial plan as their choice will have an impact on the plan that they create.

There is some key content in this learning aim that has not been taught in earlier units. In partcular, learners need to know how to to organise, carry out and document formal meetings. They will need to understand the purpose of agendas and minutes. They will need practice in creating agendas and minutes, in arranging meetings and in chairing meetings before they start their project. Teacher should produce examples using the templates given in the Assessment Workbook. Learners can then refer to these during the course of the project.

Once the teacher is confident learners are ready, then the project should begin. Leaners must be given a handover date before the launch of the project. This **cannot** be changed during the course of the project. Learners must manage their time in order to meet it. This will be discussed in detail later.

Learners need to produce their project initiation document. The teacher should provide feedback from a teacher's point of view. The feedback should be about presentation, etc., rather than the detail of what is written as that is the purpose of the project initiation meeting with the stakeholders. There should be a diary (or similar) in the classroom belonging to the senior manager and client, and learners will need to add their name to a date and time slot for their project initiation meeting. An agenda should be circulated via email in order to formally invite the senior manager and client to the meeting. The learner should chair the meeting. All of the items on the agenda should be discussed. The learner should take notes or record the discussion so that they can produce minutes that truly reflect the meeting. The learner should always get feedback that lets them know what they have done well but there should always be room for improvement. For example, (senior manager) "*I am pleased you have included the risk of me not being available for the meetings when you want to hold them but have you thought about what you will do if I am not?*" the learner could then develop this with the senior manager in order to determine a backup plan, e.g. use a peer reviewer to check progress, send their updated plan by email to get checked, etc. (client) "*I am very impressed that you have included all of the requirements for the web app, but it does not look like I will be getting a technical guide*". The learner should always have actions to carry out post meeting.

After the meeting learners should produce meeting minutes and update their project initiation document. These should then be emailed to the senior manager and client in order to get approval to continue. Approval should be formally logged in Assessment Workbook. Any communication that takes place outside of the meeting should be classed as 'informal communication' and this should be logged in the Assessment Workbook.

The learner should not produce the initial project plan until formal approval has been obtained. The plan should reflect the chosen project management methodology, e.g. if following the Waterfall method, it should contain phases like: design phase, implementation phase, testing phase, etc. Learners must include at least three planned reviews with the senior manager and client. The diary should be checked before specifying dates for these to ensure the senior manager and client are available. The reviews should be at sensible places in the plan; Assessment Workbook gives an idea of when these should be. Learners should think very carefully about contingency. They should know the aspects of the project where there could be a danger of taking longer than expected, e.g. the more complicated aspects of implementation. Once the initial plan has been completed the senior manager should inspect the plan to ensure it is realistic and provide feedback. This can be logged as part of the leaner's informal communication. The senior manager should only approve the plan when it is realistic. senior manager approval should be logged in Assessment Workbook. The teacher should ensure learners keep a copy of this initial plan so that it can be compared against the final completed plan in order to help with the completion of the review at the end of the project.

Learning aims B, C and D

The approach to these learning aims depends upon the project management methodology chosen by learners. Some may choose to design, build and test in stages, others may choose to complete the full design before moving to implementation, etc. Reviewing progress and updating the plan is fundamental throughout. It is important that learners recognise the design, development and testing has to be carried out in line with the plan. They should be consulting the plan regularly. Dates (other than the handover date) may have to change, they may take longer on some tasks, while finishing others early. They need to be proactive in managing the project; if they take longer they need to consider what they need to do to get back on track (e.g. extend the working day; combine tasks?). If they finish early, then the plan should be updated so that other tasks can be started earlier than planned. The senior manager should be able to ask to look at the plan at any point in the project and it should accurately reflect the state of the project at that moment in time. Indeed, this is something the senior manager should be doing.

The minimum required reviews must take place. These should include an agenda, chairing the meeting, take notes or recording what takes place, producing minutes and carrying out any action points. The quality of feedback provided by the senior manager and client will go a long way to ensuring the project stays on track and the product developed meets requirements, it will also greatly help with the reviews at the end of the project.

Learners should also realise the importance of informal communication. For example, if they are unclear exactly what the client wants for a particular feature then they should not wait until the next formal meeting to discuss it, they should email the client or have an informal conversation with them. All of this should be logged in the informal communication log. This will help ensure the project stays on track and also help learners produce a realistic review of their performance as the Project Manager and how they ensured the project was driven by them. Any conversations/informal reviews carried out by their peers should also be logged.

Each of the project briefs include 'extra' client requirements that should be introduced. Some requirements are introduced at the Design Review Meeting and others at the Product Review meeting. These additional requirements make the projects more realistic and will force learners to make changes to their designs and to the products that they had not anticipated. This means that they will also need to re-evaluate their plans and adjust them accordingly. By the end of these learning aims there should be more than one version of the plan:

- the initial plan
- the plan after the first review meeting
- the plan after the second review meeting
- the plan after the third review meeting.

It should be clear that the learner is driving the project and adapting the plan depending as needed, for example: dates have been changed; additional tasks have been added where necessary; unnecessary tasks removed, there is a clear indication of exactly what tasks have been completed and when.

Learners must ensure they have produced design documentation relevant to the type of product being developed and submit the product as they did for the unit the brief matches.

Learning aim E

While the end of project review meeting should appear on the plan, the written reviews do not. They should be carried out after the project hand over date. The learner will complete two written reviews; performance as a project manager and success of the product. Both reviews should draw heavily on feedback obtained throughout the project and, in particular, the end of project review meeting. Learners cannot just put forward their own views; instead, their views should be backed up by evidence from the review meetings.

Getting started

This gives you a starting place for one way of delivering the unit. It is based on the recommended assessment approach given in the specification.

Unit 10: Software design and development project

Introduction

The unit has been designed to be flexible around learners' needs. The scheme of work includes a number of lessons dedicated to each task and learning aim. They are for guidance only. The number of lessons taken for each will depend upon the individual learners. The teacher should keep in mind that their role as a teacher is to monitor progress, provide encouragement and feedback and intervene if there is a danger of the project not being completed on time. The majority of the teacher's time will be spent in the role of senior manager and client (if no employer is available). Where possible the teacher should always interact with the learner as either the senior manager or the client.

Learning aim A – Plan a software development project to meet client requirements

- This learning aim can be carried out in isolation from the rest of the learning aims. Learners do not need to all start or end this learning aim on the same day. The project they will undertake should have been agreed and they should have been given the opportunity to research the skills required in order to help them when planning the timings for tasks. They should also know the purpose of and be able to produce agendas and minutes of meetings before starting this learning aim.
- Learners need to ensure they have evidenced their achievement of this learning aim by completing the relevant tasks in the Assessment Workbook. This includes:
 - o a completed project initiation agenda
 - o completed project initiation minutes
 - o the final version of the project initiation document
 - o an updated communication log
 - the initial project plan
 - senior manager approval.

Learning aim B – Design a software product to meet client requirements

Learning aim C – Develop and test a software product to meet client requirements

Learning aim D – Monitor and review the design and development of the software project

- The completion of these learning aims will depend upon the project methodology chosen to manage the project and the type of product being developed. Again, learners do not have to be working on the same task nor complete at the same time. The most important factor is that they complete the assessment for these learning aims in line with their plan.
- Learners need to ensure they have evidenced their achievement of this learning aim by completing the relevant tasks in the Assessment Workbook. This includes:
 - o updated versions of the plan at the end of each review meeting
 - o design documentation
 - o a completed agenda for each review meeting
 - o completed minutes for each review meeting
 - o annotated designs
 - o updated communication log
 - o test plan
 - o test results
 - o a technical guide
 - o a link to the working software product.

Learning aim E - Close down the project

- This learning aim must be completed after Learning aims B, C and D. Learners should be given sufficient time after the handover of the product and the end of project review meeting to produce the minutes of the meeting and to complete their written reviews. The written reviews should not be included on their project plan.
- Learners need to ensure they have evidenced their achievement of this learning aim by completing the relevant section in the Assessment Workbook. This includes:
 - the final fully completed plan
 - o the end of project review agenda
 - o the end of project review minutes
 - o two written reviews
 - performance as a project manager
 - product review.

Details of links to other BTEC units and qualifications

This unit links to:

- Unit 1: Introduction to Programming
- Unit 2: Software Analysis and Design
- Unit 3: Website Development
- Unit 4: Programming Using Different Coding Paradigms
- Unit 5: Database Development for Web Applications
- Unit 6: Digital Graphics and Animation
- Unit 7: Mobile Applications Development
- Unit 8: Computer games development
- Unit 9: Planning and Managing Software Development Projects.

Resources

Learners should have the resources from the previous units including their own assessed work.

Websites and resources given in the other units will also be relevant for this unit.

Pearson is not responsible for the content of any external internet sites. It is essential for teachers to preview each website before using it in class so as to ensure that the URL is still accurate, relevant and appropriate. We suggest that teachers bookmark useful websites and consider enabling learners to access them through the school/college intranet.

Scheme of work

Unit	Unit 10: Software Design and Development Project
Guided Learning Hours	180
Number of lessons	60
Duration of lessons	3 hours
Links to other units	Unit 1: Introduction to Programming
	Unit 2: Software Analysis and Design
	Unit 3: Website Development
	Unit 4: Programming Using Different Coding Paradigms
	Unit 5: Database Development for Web Applications
	Unit 6: Digital Graphics and Animation
	Unit 7: Mobile Applications Development
	Unit 8: Computer games development
	 Unit 9: Planning and Managing Software Development Projects.

	Key to learning opportunities			
AA	Assessment Activity	RS	Revision Session	
GS	Guest Speaker	v	Visit	
IS	Independent Study	WE	Work Experience	

#	Торіс	Lesson type	Suggested activities	Resources
1-3	Introduction to the unit	IS	 Starter activity: Introduce the unit and project briefs to learners. Small group/paired activity: Learners split into groups. Each group discusses which brief they would like to do and why, what skills they already have, what skills they think they will need to research and learn. Teacher-led discussion: Teacher discusses and agrees a project brief selection with each learner. Teacher-led discussion: Teacher explains agendas and minutes. Learners given examples. Small group activity: Teacher splits learners into groups. Learners manage a mini project based around a student exchange trip. They will practice meeting administration tasks. 	Unit specification Project briefs Agenda and minutes of meeting examples Student exchange trip scenario Computers with appropriate software and internet access
	-		ate. Learners should work at their own pace in order to complete the projec are all learners will be completed on time	t. The number of lessons
4-8	Research	IS	• Individual activity: Learners carry out research into skills they need to develop (e.g. for the programming brief - how to handle files) and they then work to develop these skills.	Project briefs Computers with appropriate software and internet access

#	Торіс	Lesson type	Suggested activities	Resources
9-15	Learning aim A	IS AA	• Individual activity: Learners initiate the project and produce their initial project plan (Assessment Workbook, Tasks 1 and 2).	Assessment Workbook Project briefs Computers with appropriate software and internet access
16-54	Learning aims B, C and D	IS AA	Individual activity : Learners manage the project to design, develop, document and test their software product (Assessment Workbook, Tasks 3 and 4). This will also include planning and managing the design progress review meeting and the development progress review meeting; and monitoring progress and updating the plan, the designs and the product where necessary, including where additional requirements are introduced by the client.	Assessment Workbook Project briefs Additional project requirements document Computers with appropriate software and internet access
55-58	Learning aim E	IS AA	• Individual activity: Learners close down the project (Assessment Workbook, Task 5). This will include carrying out an end-of-project review meeting and reviewing the success of the project.	Assessment Workbook Project briefs Computers with appropriate software and internet access

#	Торіс	Lesson type	Suggested activities	Resources
59-60	Unit closure	IS	 Learner-led presentations: Learners present their final product to other learners. This could be in small groups where they present to each other or each learner presents to the rest of the class. Teacher-led discussion: Feedback gathered from learners in terms of unit, e.g. resources, how they think it compares to realworld projects, how they think it will help them when employed, 	Smartboard or projector Learners' completed projects Questionnaire on the unit
			 etc., improvements to the unit, etc. Individual activity: Complete the feedback questionnaire and identify improvements that could be made to the unit. 	

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 10: Software Design and Development Project
Lesson number	1–3 (9 hours)

Lesson objectives	At the end of the lesson, learners will:
	• agree with teacher a suitable project brief
	 practice preparing for, holding and documenting meetings.

Resources checklist	• PS Presentation on the unit content
	Project briefs
	Agenda template and examples
	Minutes template and examples
Key: AS : Activity Sheet; TF :	Femplate Form; PS : Presentation Slide

Activities	Teaching notes
Presentation on unit content (30 minutes)	• Teacher presentation: Explain the structure of the unit and the approach to completing and assessing it. This includes who will be involved in the project (client, senior manager and project manager), and an overview of the tasks needed to complete the unit.
Select project brief (60 minutes)	 Small group/paired activity: Learners split into groups. Each group discusses which brief they would like to do and why, what skills they already have, what skills they think they will need to research and learn. Teacher-led discussion: Teacher discusses and agrees
	a project brief selection with each learner.
Agendas and minutes (15 minutes)	• Teacher-led discussion: explain and show agendas and minutes. Learners should be given examples that the teacher has created using the templates in the Assessment Workbook.
Introduction to meeting – practice activity (15 minutes)	 Teacher presentation: introduce activity. Explain to learners that they will undertake a mini project in order to practice managing their time and practicing the administration of meetings. The teacher will need to provide a scenario based on a student exchange trip: learners from a college in the UK will be coming to stay in Uzbekistan for a week. Groups will be responsible for planning the visit.
Meeting practice activity – role allocation and research (3 hours)	• Small group activity: Teacher will need to split learners into groups. The group members will need to decide on tasks each member will be responsible for – e.g. Where will the UK learners stay? Who will pick them up from the airport? What transport will they use? What activities will they do, where will they eat while they are here, etc.? What sights should they be taken to see? Each group member will have different tasks to do. The groups will then have to decide how long they will spend on researching the task.
Prepare for, chair and document a meeting (4 hours)	 Individual / team activity: Each member of the group must be responsible for one meeting. Preparation will include producing an agenda and inviting the rest of the group members. Each learner will then chair their own meeting, take
	notes, and then produce and circulate the minutes of the meeting.

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 10: Software Design and Development Project
Lesson number	4–8 (15 hours)

Lesson objectives	At the end of the lesson, learners will:
	 research and develop software development skills in relation to the project brief selected.

Resources checklist	Project briefs
Key: AS : Activity Sheet; TF : Template Form; PS : Presentation Slide	

Activities	Teaching notes
Research and development (15 hours)	• Individual activity: Learners carry out research into skills they need to develop in order to meet client requirements for the project brief selected and they then work to develop these skills.

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 10: Software Design and Development Project
Lesson number	9–15 (21 hours) (approximate timings)

Lesson objectives	At the end of the lesson, learners will:
	• complete Tasks 1 and 2 in their Assessment Workbooks.

Resources checklist	Assessment Workbook
	Project briefs
	Computers with suitable software
Key: AS : Activity Sheet; TF : Template Form; PS : Presentation Slide	

Activities	Teaching notes
Project initiation and initial project plan	• Individual activity: Learners complete Tasks 1 and 2 in their Assessment Workbooks.

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 10: Software Design and Development Project
Lesson number	16–55 (120 hours) <i>(approximate timings)</i>

Lesson objectives	At the end of the lesson, learners will:
	• complete Tasks 3 and 4 in their Assessment Workbooks.

Resources checklist	Assessment Workbook
	Project briefs
	• Additional project requirements to be introduced at the design review meeting and at the development review meeting.
	Computers with suitable software

Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide

Activities	Teaching notes
Managing a software project to design and develop, document and test a software product	• Individual activity: learners complete Tasks 3 and 4 in their Assessment Workbooks.

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 10: Software Design and Development Project
Lesson number	56–58 (9 hours) <i>(approximate timings)</i>

Lesson objectives	At the end of the lesson, learners will:
	• complete Task 5 in their Assessment Workbooks.

Resources checklist	Assessment Workbook
	 Project briefs and additional requirements that were introduced at the design review meeting and the development review meeting
	Computers with suitable software
Kay: AS: Activity Sheet: TE: Template Form: BS: Procentation Slide	

Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide

Activities	Teaching notes
Closing down a project	Individual activity: Learners complete Task 5 in their Assessment Workbooks.

Qualification	Pearson BTEC Uzbekistan Level 4 Qualifications in Software Development
Unit	Unit 10: Software Design and Development Project
Lesson number	59–60 (6 hours)

understand the strengths and weaknesses of their	
project compared to other learners	
express their views on the unit.	

Resources checklist	Learners' completed projects
	Questionnaire on the unit
	Formulato Formu DC : Drocontation Clide

Key: **AS**: Activity Sheet; **TF**: Template Form; **PS**: Presentation Slide

Activities	Teaching notes
Learner presentations (4 hours 30 minutes)	• Learner-led presentations: Learners take it in turns to present their final product to other learners. This could be in small groups where they present to each other or each learner presents to the rest of the class. Other learners should have the opportunity to try out the products and give feedback on them.
Feedback on unit (90 minutes)	 Teacher-led discussion: Feedback gathered from learners in terms of unit, e.g. resources, how they think it compares to real-world projects, how they think it will help them when employed etc, improvements to the unit. Individual activity: Complete the feedback questionnaire and identify improvements that could be made to the unit.

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