



Accredited

OCR LEVEL 2 CAMBRIDGE TECHNICAL CERTIFICATE/DIPLOMA IN IT

FUNDAMENTALS OF COMPUTER APPLICATIONS

R/505/4633

LEVEL 2 UNIT 26

GUIDED LEARNING HOURS: 60

UNIT CREDIT VALUE: 10



FUNDAMENTALS OF COMPUTER APPLICATIONS

R/505/4633

LEVEL 2

AIM AND PURPOSE OF THE UNIT

This unit allows the learner to explore the development and use of computer applications. The learner will understand how computer applications are designed, the need for a consistent approach and be able to explain the tools used. This involves creating a design for a computer application for which they have been given a suitable specification. Learners will be able to produce a simple level of technical documentation for development and testing.

ASSESSMENT AND GRADING CRITERIA

Learning Outcome (LO)	Pass	Merit	Distinction
The learner will:	The assessment criteria are the pass requirements for this unit. The learner can:	To achieve a merit the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
1 Understand features of computer applications	P1 describe features of a computer application	M1 explain why features vary across different categories of computer applications	D1 explain how features used within computer applications have evolved
2 Know how computer applications are used	P2 describe how computer applications are used by individuals	M2 explain how computer applications have been utilised by business	
3 Be able to design a computer application	P3 create design plans for a computer application to meet a client's requirements	M3 review the design for the computer application suggesting enhancements to the client's requirements	D2 implement changes to original design based on suggested enhancements
4 Be able to create technical documentation for a computer application	P4 produce a technical specification for a computer application	M4 create a test plan for a computer application based on the technical specification	

TEACHING CONTENT

The unit content describes what has to be taught to ensure that learners are able to access the highest grade.

Anything which follows an i.e. details what must be taught as part of that area of content.

Anything which follows an e.g. is illustrative, it should be noted that where e.g. is used, learners must know and be able to apply relevant examples to their work though these do not need to be the same ones specified in the unit content.

LO1 Understand the features of computer applications Application development lifecycle:

What is a computer application: Any application software; development for mobile devices; personalisation; use of GPS and Bluetooth, simple user interface. Limitations and issues: social implications of using applications, security issues e.g. viruses, range and bandwidth (can be poor in rural areas), potential health hazards e.g.; using applications while driving, social issues due to addiction to games.

Categories: e.g. education, information, communication, productivity, reference

Features: scalability; simplicity for user; performance; offline availability; Bluetooth; GPS; Multi-platform; support and updates; personalisation.

Evolution: e.g. advances in technology, reduction of costs, creativity, market need, globalisation, pioneers.

LO2 Know how computer applications are used

Types of platform: e.g. mobile phones, smart phones, tablet PC, desktop

Genres of computer applications: e.g. productivity & utility, music, games and entertainment, news and reference, e-commerce, sport, social networking, retail.

Audience – e.g. businesses, young children, teenagers, adults, sports fans, journalists etc.

LO3 Be able to design a computer application

Planning an application: tools e.g.: storyboard, structure diagrams, data dictionaries, design time property charts (where appropriate)

Accessibility: understand accessibility considerations e.g.: colour vision, dyslexia

- requirements analysis,
- specifications e.g. inputs, processing, outputs, scope,
- user interface,
- HCI issues e.g. accessibility,
- hardware constraints;
- timescales;
- designs;
- code;
- testing;
- maintenance, e.g. updates, patches
- enhancements/improvements

LO4 Be able to create technical documentation for a computer application

Content of a technical specification: feasibility of creating the application: availability of hardware and software, developer skills, costs, market for application/competition

Cost of failures in software: cost of fixing bugs; loss of customer confidence: loss of market share; more extreme, loss of life.

Development of a test plan and test log: date of test; test number; expected result; actual result; any corrective actions required.

Use of normal, extreme and borderline data, meets criteria from the initial specification. Calculations e.g. VAT percentages, format of numbers, dates.

DELIVERY GUIDANCE

This unit prepares the learner for a junior role in a software development team. As such, it is necessary for the learner to experience the process of designing, potentially coding and then testing a programmed solution to a realistic problem. The learner should be required to create a range of programmed solutions to sets of simple requirements.

A useful resource would be guest speakers, possibly drawn from the local community, talking about their knowledge and experience of programming and the design of applications, and perhaps careers in programming. The possibility of work experience with a software company would be particularly beneficial.

Understand the features of computer applications

Learners need to know a brief history of how applications have developed from the early pioneers to the present day. e.g.: mobile phone applications, programming of other everyday items, business applications, educational applications, medical applications, and games

They should identify from research in this area, the key features within applications, and understand how these form the basis for the functionality. They should be encouraged to compare a range of applications, using their own technology devices and also through research within application stores. This will enable them to identify common features by genre.

Know how computer applications are used

From their research within Learning Outcome 1, learners should be able to extend their understanding of applications, and how they can be divided into different genres, e.g. business applications, productivity etc. This distinction can be arbitrary where an application has multiple purposes for different users. Learners need to be made aware that although individuals are the biggest users of applications, most applications developed have a business or commercial focus. Most businesses have now used, or are exploring, the use of applications and mobile technologies. Learners need to demonstrate an awareness of the social implications of the use of applications e.g. issues of social networking applications. Research, group work and discussion are the best learning environments for this.

Be able to design a computer application

The emphasis for the learner is on creating an effective design for an application. The design for an application should produce a visual Human Computer Interface rather than a command line interface. Designs should explore accessibility considerations e.g. suitable use of colour. Learners should review specifications within the public domain, and others they have access to, as a basis for their ideas and plans. They should be encouraged to create a range of outline design plans for an individual solution, to enable them to review appropriateness for identified specifications. Although not part of the assessment criteria, it is a good learning experience for learners to create a prototype application based on their preferred design option, as it will enable them to see first-hand where lack of detail, functionality and technical considerations can cause problems for a developer. There are a number of free development environments that can be used to create applications, or 'apps'. See list in Resources section below.

The learners should evaluate each other's designs; even swap designs and try to implement them during the formative stages of the unit prior to undertaking a more challenging assessment.

Be able to create technical documentation for a computer application

Learners need to know the content of a technical specification. Much of this knowledge may already have been acquired during the earlier teaching elements during the unit, but learners should revisit, and further research: clients' specification; designs; hardware requirements; software requirements, staff/ client skills etc. Learners should be able to identify and recognise possible issues with the application or existing application and feasibility for successful implementation, based on prior learning.

Learners need to understand why any application must be tested before being handed over to an end user. The learners need to be aware of the balance between the costs of testing against the costs of failures. Learners should research, discuss and review widely publicised failures and the approaches of larger organisations to beta testing with customers. Case studies of systems that have failed could be used, as role play could be used where learners experience the issues for the different stakeholders in the development of a programming solution which failed. Learners could also work in groups to investigate the consequences of not testing a programme effectively. Equally learners could be given case studies where programmes apparently work effectively. Learners should create an effective test plan for their application.

SUGGESTED ASSESSMENT SCENARIOS AND TASK PLUS GUIDANCE ON ASSESSING THE SUGGESTED TASKS

Assessment Criteria P1, M1, D1

For P1 learners must describe the features of a specified computer application of their choice. They could prepare a presentation or report, and this should cover a wide range of features, and could possibly include limitations or suggested enhancements of the application.

For merit criterion M1 learners must explain why features vary across different categories of computer applications. This may be an extension of P1, and the learner should explain why different categories of application have different features and functionality. This would ideally be across a range of applications within different categories.

For distinction criterion D1 learners must explain how features used within computer applications have evolved. Learners should discuss a range of factors they consider important in the development of applications from the earliest applications on mobile devices until the modern day. This could be in the form of a timeline. Learners could also outline the role of any pioneers in the field of application creation and how this has influenced their evolution.

Assessment Criteria P2, M2

For P2 learners must describe how computer applications are used by individuals. They could prepare a presentation or report describing the use of a range of applications for individuals, considering a range of genres.

For merit criterion M2 learners must explain how computer applications have been utilised by business. They could prepare a presentation or report explaining why different applications are required, and how businesses have utilised them. They should make reference to a range of applications of different genres.

Assessment Criteria P3, M3, D2

For P3 learners must create design plans for a computer application to meet a client's requirements. This evidence should include annotated diagrams of the interface (HCI) tables listing controls and their properties, and other relevant evidence as outlined in the teaching content.

For merit criterion M3 learners must review the design for the computer application suggesting enhancements to the client's requirements. This may be an extension of the Pass criteria, and learners will need to review their designs against the original

specification, which may include peer and client review of their designs. They should also suggest enhancements based on their ideas and any feedback.

For distinction criterion D2 learners must implement changes to the original design based on suggested enhancements. This will be an extension of M3. Learners will need to show the enhancements to their initial designs and the changes required within the specification. The production of a prototype application may support these enhancements but is not required as evidence for the changes to the design.

Assessment Criteria P4, M4

For P4 learners must produce a technical specification for a computer application. The specification should include consideration for the criteria identified within the Teaching Content.

For merit criterion M4 learners must create a test plan for a computer application based on the technical specification. The test plan used as evidence should be designed as an extension to the technical specification, and include an effective test plan and test log which records the expected results to a series of tests on the designed application, and allows for observed results and re-tests to be included at a future date. The test plan should include normal, extreme and borderline data or a table of performance criteria related to the initial specification.

SUGGESTED SCENARIOS

Learners could prepare presentations, leaflets or more formal reports that could be given to a junior programmer starting work in software development team or as part of work experience. Learners would be expected to produce designs for a simple programmed application, and finally test a software solution.

RESOURCES

Windows Phone SDK

www.developer.nokia.com/Develop/Windows_Phone/Getting_started/

Android SDK

www.developer.android.com/sdk/index.html#download

iOS

<https://developer.apple.com/devcenter/ios/index.action>

Appy Pie -

www.appypie.com/

iBuildApp

www.ibuildapp.com/

MAPPING WITHIN THE QUALIFICATION TO THE OTHER UNITS

Unit 9: Website development

Unit 13: Interactive media production

Unit 16: Project planning using IT

Unit 17: Customising software

Unit 20: Database systems

Unit 22: Developing computer games

Unit 23: Spreadsheet modelling

LINKS TO NOS

4.2 Data Analysis

4.5 DataDesign

6.1 Information Management



CONTACT US

Staff at the OCR Customer Contact Centre are available to take your call between 8am and 5.30pm, Monday to Friday.

We're always delighted to answer questions and give advice.

Telephone 02476 851509

Email cambridgetechnicals@ocr.org.uk

www.ocr.org.uk