



Accredited

OCR LEVEL 3 CAMBRIDGE TECHNICAL CERTIFICATE/DIPLOMA IN IT

**EXPLORING COMPUTER
APPLICATIONS**

M/505/5403

LEVEL 3 UNIT 36

GUIDED LEARNING HOURS: 60

UNIT CREDIT VALUE: 10



EXPLORING COMPUTER APPLICATIONS

M/505/5403

LEVEL 3 UNIT 36

AIM AND PURPOSE OF THE UNIT

This unit will enable learners to recognise that there are a wide variety of computer applications or “apps”; these applications having differing roles in business and other environments. It will also provide learners with an understanding of the need to maintain professional standards when developing computer applications to support maintenance and adaptation.

On completing this unit learners will be able to create effective designs for a computer application which could be implemented using one or more programming languages or development environments. Learners will also be aware of different platforms for applications and how a successful application may be created across platforms. Learners will also be able to create the technical documentation to support development.

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 key features of computer applications	P1 explain key features of computer applications	M1 compare and contrast computer applications with similar functions	
2 Understand different uses for computer applications	P2 explain the use of a range of different computer applications	M2 explain how computer applications have evolved	
3 Be able to develop a computer application	P3 develop a design document for a computer application based on a given specification	M3 conduct a feasibility study for the specified computer application	D1 evaluate computer application paradigms justifying the choice of possible development hardware and software
	P4 create a computer application design		D2 recommend improvements and maintenance to enhance the application
4 Be able to document solutions for a computer application	P5 create technical documentation for a computer application		

TEACHING CONTENT

LO1 Understand key features of computer applications

Features of successful computer applications: scalability; simplicity for user; performance; offline availability; Bluetooth; GPS; multi-platform; support and updates; personalisation.

Limitations: range & bandwidth; security issues e.g. working on mobile public networks, viruses etc., power consumption; transmission interferences e.g. weather, terrain and rural areas where reception is often poor; potential health hazards e.g. driving while using device, interference with medical devices.

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

LO2 Understand different uses for computer applications

Types of environment: 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.

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

LO3 Be able to develop a computer application

Interpret a program specification and create a design for an application

Design tools: e.g. storyboards, data flow diagrams, structure diagrams, data dictionaries, pseudo code, TOE (task, object, event) charts, structured English, naming conventions for control objects, PERT charts, Gantt charts, critical path analysis

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

Application development lifecycle:

- 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.

Methods: e.g., Waterfall Method, Rapid Application Development (RAD), V model, spiral method; use of CASE tools, Unified Modelling Language (UML)

Elements of a program specification:

- input descriptions e.g. mouse keyboard, touch screen, voice input, accelerometer
- output descriptions: e.g. monitor, mobile device, print, wide screen, projector
- data structure descriptions: data bases, files, records, and data elements
- physical environment where program will be executed

Feasibility study: market/ business feasibility e.g. what is the market for Apps; Technical feasibility e.g. hardware and software availability, technical skills; financial feasibility e.g. costs of production, profits

Implementation of an application: Use of appropriate development environment; syntax; data validation; error handling; debugging, Use of mobile development platforms. Cross platform development software. Development environments - text editors, commercial development environments and online development environments

LO4 Be able to document solutions for a computer application

Technical documentation

User guide: Purpose of application; installation; system requirements; tutorial on how to use application; explanation of any error messages

Technical information: Original specification, overview of any constraints, explanation of how solution achieved.

Coding application: e.g. commenting code, appropriate names for variables, procedures and functions, indentation (where appropriate)

Testing: development of a test plan structure e.g. date of test, test number, expected result, actual result, any corrective actions required

Use of normal, extreme and borderline data, explanation/ recording of any error messages

DELIVERY GUIDANCE

To deliver this unit the tutor may choose to follow the order of the teaching content but this is not essential. It is important that the focus is on ensuring that learners have the opportunity not only to acquire the necessary knowledge but also to practice and achieve the level and range of skills listed in the assessment criteria. The key is to define the term App. App is short for Application i.e. a software application or software programme. It is essential that learners understand the true meaning, although for the purposes of this unit app is used as a term learners will easily recognise. An app is more recently associated as a special type of programme designed for use on mobile devices, although it is now becoming increasingly more widely available for the desktop.

LO1 Understand key features of computer applications

Learners need to be made aware of the huge market for computer applications that has developed over the last few years. Learners need to investigate the most successful applications, (not just games), identifying the key features they have in common e.g. connectivity, simplicity for user via one handed use, touch screen etc. Learners should also explore the value of features linked to GPS resulting in location-based information in addition to other customisations. Creating personalised content based on individual usage or context, learners could investigate the advantages and disadvantages of this feature for a range of identified apps.

Learners should be made aware of the limitations of any application. Many applications particularly mobile apps, have a requirement to be constantly logged in to a network to allow specific information or notifications being 'pushed' to the application as they become available. Learners need to be made aware of the security and data usage issues linked to this requirement.

Learners should also be encouraged to compare and contrast the features of similar applications. This could give the opportunity for a visiting entrepreneur to showcase their own app or apps.

LO2 Understand different uses for computer applications

Learners should be aware of the growing market for computer applications; they should explore the different genres of applications and the potential audiences for each. They could analyse these in groups and discuss different applications and their use in different environments.

Guest speakers, possibly drawn from the local employers, talking about their knowledge and experience of programming and the design of applications, also possible careers in creating applications, would be a useful resource. The possibility of work experience with a software company/organisation using or developing apps would be particularly beneficial. Learners could also be encouraged to identify potential new applications or potential enhancements to existing applications to appreciate the technologies and the functions available.

LO3 Be able to develop a computer application

Here there are a number of approaches. Many learners may be encouraged by the opportunity to design and implement an "app". These are becoming ubiquitous with the use of tablets and smart phones. These apps can be HTML based or coded with scripting languages, or both. Learners should be given the opportunity to explore the use of coding with text editors, coding of web applications, the use of commercial development environments and online development environments. The use of some development environments may not require the user to do any coding; this is within the spirit of the module, and would allow learners to develop a more advanced app and concentrate on the design and documentation elements which are the main focus of the unit.

Learners need to create practice designs for given specifications, learning to consider and include the creation of data dictionaries, structure diagrams, interface designs, data flow diagrams, pseudo code etc. as appropriate. Learners should also demonstrate that they have considered development models e.g. Rapid Application development (RAD), and be able to relate their design to this model.

Learners should also explore the use of the different tools used for designing applications; case studies could be used to highlight successful commercial projects.

There are a number of free development environments that can be used to create applications, or 'apps'. See list in Resources section below.

LO4 Be able to document solutions for a computer application

Learners need to understand the importance of technical documentation for any program that is developed and implemented. Learners need to understand what the technical documentation should contain for all users i.e. developers, designers, customers. Learners should be

encouraged to analyse a program specification, review and understand the contents of a user guide, appreciate the format of documentation for program designs, the importance of a development schedule, help materials, commented code, test plans and test logs. Learners should research the range of documentation required from solutions that may be more widely available.

Learners need to know the structure of a test plan. They need to understand the criteria to be documented, the information to be entered and where there are numerical inputs and outputs; learners will need to calculate the expected values. Learners will also need to appreciate the need to use normal, extreme and borderline data, and should be exposed to a range of these during testing. Learners should carry out physical testing, and be encouraged to record actual results, any corrective actions required together with explanations / recording of any error messages. Learners should also consider feedback from users/ clients of any programmed applications they have produced.

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

The evidence could be generated as a single, holistic assignment with components generated from the individual assessment criteria. It must be clearly identified within the evidence, which assessment criteria are being met.

Assessment Criteria P1, and M1

For P1 learners must explain the key features of computer applications. This may best be done as a presentation where visual representations and characteristics can be described.

For merit criterion M1 the learner could extend the presentation or documentation to compare and contrast the features offered by a number of computer applications with a similar function.

Assessment Criteria P2, M2

For P2 learners must explain the use of a range of different computer applications. They should identify the audience and the scope of functionality. This could be evidenced through a presentation, video or report.

For merit criterion M2 learners must explain how computer applications have evolved. This requires the learner to research the historical use of applications, the technologies on which they were based, and how user requirements and advances in technology have influenced this evolution. This could be presented using an annotated timeline or visual representation, or by a presentation or report.

Assessment Criteria P3, M3 and D1

For P3 the learner must develop a design document for a computer application for a given specification. They should use recognised method and design tools and at this level, PERT charts, Gantt charts and critical path analysis would be expected.

For merit criterion M3 learners must conduct a feasibility study for the computer application designed for P3. Learners would be expected to discuss what market exists for an application, the technical feasibility e.g. hardware and software available or required, technical skills required to produce the computer application and the financial feasibility e.g. costs of production, possible profits.

For distinction criterion D1 learners must evaluate the computer application paradigms. They should include how successful the tools and methods used in creating the design for the application specified were, any barriers to them completing the design in a timely manner, and their selection of hardware and software. Learners should also include the types of development environment.

Assessment Criteria P4, M4 and D2

For P4 learners must create a computer application design using an appropriate development environment. This may be evidenced by the developed application itself, which has been produced in an appropriate programming language or appropriate application development environment for a given specification.

For distinction criterion D2, learners must recommend improvements and maintenance to enhance the application. This may be in the form of annotations to the original design document, or may be a document with tables to demonstrate the proposed changes.

Assessment Criteria P5

For P5 the learner must create the technical documentation for a computer application. This ideally should be in the form of a report and should contain details of the configuration and management of the designed and developed application. This report essentially collates much of the work the learner has already completed for other criteria, and should show consideration for all of these aspects. There should be an index and an overview of the application specification. There should also be recommendations for, or the outline structure of, a test plan.

RESOURCES

Windows Phone SDK - http://www.developer.nokia.com/Develop/Windows_Phone/Getting_started/

Android SDK - <http://developer.android.com/sdk/index.html#download>

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

Appy Pie - free to design an app - <http://www.appypie.com/>

iBuildApp - <http://ibuildapp.com/>

MAPPING WITHIN THE QUALIFICATION TO THE OTHER UNITS

Unit 10 Developing computer games

Unit 12 Website production

Unit 14 Computer animation

Unit 16 2D animation production

Unit 17 Interactive media authoring

Unit 18 Web animation for interactive media

Unit 19 Spreadsheet modelling

Unit 23 Database design

Unit 25 Data analysis and design

Unit 35 Systems development requirements and constraints

LINKS TO NOS

4.2 Data Analysis

5.2 Software Development



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