

Cambridge **TECHNICALS LEVEL 3**

IT

Unit 12

Mobile technology

R/507/5014

Guided learning hours: 60

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Guided learning hours: 60

Essential resources required for this unit: Learners will need access to multiple mobile devices.

This unit is internally assessed and externally moderated by OCR.

UNIT AIM

You may come to this unit as a proficient user of a mobile phone but you may be less familiar with other mobile technologies and their operating systems. The aim of this unit is to broaden your knowledge and understanding of the wider potential of mobile technologies and its consequences to people and businesses. This unit is as much about new technologies as it is about promoting critical analysis of existing situations and proposing better solutions.

Technical developments move quickly and legislation usually lags behind. Tutors are encouraged to incorporate relevant new developments and laws into this unit.

This unit is an optional unit to the Emerging Digital Technology Practitioner pathway due to the strong links between mobile technology and emerging digital technologies. In addition it is also in the Application Developer pathway due to the increase in the use of mobile technology within business, as application developers need to have a good understanding of the uses of mobile technology and the technologies involved and as mobile technology is now in wide use by individuals and businesses. It is also in the IT Infrastructure Technician specialist pathway as it is important that IT technicians have an understanding of the hardware, software and technology involved. This unit will provide them with an insight into mobile technology providing them with the foundation to develop their skills, knowledge and understanding of this important area further in the future.

Knowledge gained in the study of this unit will also help prepare you for relevant industry qualifications such as CompTIA Mobility+.

TEACHING CONTENT

The teaching content in every unit states what has to be taught to ensure that learners are able to access the highest grades.

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 in their work, although these do not need to be the same ones specified in the unit content.

For internally assessed units you need to ensure that any assignments you create, or any modifications you make to an assignment, do not expect the learner to do more than they have been taught, but must enable them to access the full range of grades as described in the grading criteria.

Learning outcomes	Teaching content
The Learner will:	Learners must be taught:
1. Understand mobile technologies	1.1 Devices, i.e.: <ul style="list-style-type: none"> • Sizes (e.g. phone, phablet, tablet, sat-nav, smart watch) • embedded (e.g. laptop, watch, car for insurance purposes) • active versus passive • input (e.g. mini keyboard, voice, touchscreen) • output (e.g. print, audio and vibration alerts) 1.2 Connectivity, i.e.: <ul style="list-style-type: none"> • wired vs wireless (e.g. number of users, range, mobility, security, ease of access) • cellular technologies (e.g. CDMA, TDMA, GSM, CDS) • routing, e.g.: <ul style="list-style-type: none"> ○ IP address ○ IPv4 and IPv6 ○ DHCP vs static IP ○ Subnet Mask and Default Gateway ○ MAC address • network characteristics, e.g.: <ul style="list-style-type: none"> ○ bandwidth ○ latency ○ jitter ○ reliability • standards, e.g.: <ul style="list-style-type: none"> ○ GPS ○ 3G/4G/5G ○ Wi-fi ○ Blue-tooth ○ USB • limitations, ranges and uses of different standards, e.g.: <ul style="list-style-type: none"> ○ signal strength ○ effects of distance and intervening objects ○ IEEE 802.11 ○ frequencies e.g. 2.4 GHz, 5 GHz ○ channels and interference ○ RF characteristics (e.g. modulation, bandwidth, wavelength, amplitude, phase) ○ Preparation theory (e.g. absorption, refraction, reflection, interference) ○ Antennas (e.g. Omni-directional, semi-directional, bi-directional)

Learning outcomes	Teaching content
The Learner will:	Learners must be taught:
	<p>1.3 Mobile device operating systems, i.e.:</p> <ul style="list-style-type: none"> • Android • Windows • iOS • Linux based, e.g. Sailfish OS, Ubuntu Touch • future operating systems • advantages/disadvantages • characteristics • features <p>1.4 Current and potential future uses, e.g.:</p> <ul style="list-style-type: none"> • Internet of Things • smart city • tagging endangered species • robotic devices e.g. iRobot vacuum cleaner • sat-nav • consumer internet e.g. price check in supermarket, QR codes • GPS • health monitors • CCTV • drones • ATC and TCAS • stock control and theft reduction with RFID • car trackers • electronic tagging of offenders • cars, e.g. self drive, traffic update
<p>2. Be able to investigate how businesses use mobile technologies</p>	<p>2.1 Uses of mobile technologies, e.g.:</p> <ul style="list-style-type: none"> • access to information from remote locations • maintain contact between staff • collaborative working • using cloud based solutions to reduce up-front technology costs • increase productivity and profitability • using social media for digital marketing <p>2.2 Ethical, e.g.:</p> <ul style="list-style-type: none"> • child tracking • grooming and secrecy • personal data, e.g. location • employees always contactable • haves and have-nots
<p>3. Be able to determine solutions for the use of mobile technologies</p>	<p>3.1 Investigating business requirements, i.e.:</p> <ul style="list-style-type: none"> • client needs and wants • end user needs and wants • limitations (e.g. target platform, bandwidth, development resources, human resources, etc.) • prototyping • interfaces (e.g. hardware, software, communications, user)

Learning outcomes	Teaching content
The Learner will:	Learners must be taught:
	<p>3.2 Planning, i.e.:</p> <ul style="list-style-type: none"> • cost: <ul style="list-style-type: none"> ○ cost of ownership ○ frequent upgrades due to cutting edge ○ multiple device sizes and incompatible devices • risks e.g. data security • constraints, e.g.: <ul style="list-style-type: none"> ○ legal (e.g. tracking a lorry is also the tracking of the driver, countries have different laws) ○ technological (e.g. signal coverage areas, cutting edge technology implications) ○ compatibility between competing devices ○ power requirements (e.g. passive or active, charging of a battery powered device) • staff training <p>3.3 Technology business plan, i.e.:</p> <ul style="list-style-type: none"> • current and future use (e.g. how is technology used now within the business and how will it be used in the future) • identifying appropriate technology (e.g. future hardware and software needs, integration with other technology and systems) • allow for advances in technology
<p>4. Be able to present solutions for the use of mobile technologies</p>	<p>4.1 Promoting the mobile technological solution, i.e.:</p> <ul style="list-style-type: none"> • summarising technical details to a non-technical audience • verbal versus written communication • making a convincing case • projecting confidence <p>4.2 Improvements to mobile technological solution, i.e.:</p> <ul style="list-style-type: none"> • obtain feedback from stakeholders • analyse feedback • confirm viability of changes • implement improvements to solution based on viability of feedback <p>4.3 Predicting consequences of change, i.e.:</p> <ul style="list-style-type: none"> • future actions or events which are measurable (e.g. increased profits, customer satisfaction, response time)

GRADING CRITERIA

LO	Pass	Merit	Distinction
	The assessment criteria are the Pass requirements for this unit.	To achieve a Merit the evidence must show that, in addition to the pass criteria, the candidate is able to:	To achieve a Distinction the evidence must show that, in addition to the pass and merit criteria, the candidate is able to:
1. Understand mobile technologies	P1: Describe different methods of mobile device connectivity	M1: Compare and contrast different operating systems used in mobile technology	D1: Evaluate the suitability of mobile technologies for different situations
2. Be able to investigate how businesses use mobile technologies	P2*: Carry out research on the impact of mobile technologies on businesses <i>(*Synoptic assessment from Unit 1 Fundamentals of IT, Unit 2 Global information and Unit 3 Cyber security)</i>	M2: Examine the ethical implications of the use of mobile technologies	
3. Be able to determine solutions for the use of mobile technologies	P3: Investigate the mobile technological requirements for an identified business need	M3: Prepare a technology business plan to support the implementation of the mobile technological solution for the business	
	P4: Plan a mobile technological solution for an identified business need		
4. Be able to present solutions for the use of mobile technologies	P5: Promote the mobile technological solution to relevant stakeholders		D2: Predict the effectiveness of the mobile technological solution for the identified business need
	P6: Improve the proposed mobile technological solution based on stakeholder feedback		

SYNOPTIC ASSESSMENT

When learners are taking an assessment task, or series of tasks, for this unit they will have opportunities to draw on relevant, appropriate knowledge, understanding and skills that they will have developed through other units. We've identified those opportunities in the grading criteria (shown with an asterisk). Learners should be encouraged to consider for themselves which skills/knowledge/understanding are most relevant to apply where we have placed an asterisk.

ASSESSMENT GUIDANCE

Passes are expected to be limited to factual information. Merits are expected to show comparison, analysis and justifications. Distinctions are expected to be written reports with balancing arguments and a conclusion.

LO1 Understand mobile technologies

P1: Learners are required to describe different methods of mobile device connectivity. They should not concentrate only on the connectivity methods of mobile phones, although the technologies used by mobile phones should be included. Descriptions should include characteristics and limitations as well as their uses. The evidence can be in the form of a report, a presentation with detailed speaker notes, a tutor resource or a technical guide.

M1: Learners are required to compare and contrast different operating systems used in mobile technology. The comparisons should include the features and characteristics of each system as well as the advantages/disadvantages of each. Evidence can be presented as a technical guide, a report or a presentation with detailed speaker notes.

D1: Learners are required to evaluate the suitability of mobile technologies for different contexts. Learners will draw on their knowledge and understanding for P1 and M1 when carrying out their evaluation of the different mobile technologies. Evidence can be in the form of a presentation with detailed speaker notes or a video of learners delivering the presentation to a 'business' to promote the concept of using mobile technology in their business. The evidence could also be in a form of a report or technical guide.

LO2 Be able to investigate how businesses use mobile technologies

P2: Learners are required to carry out research into the impact of mobile technologies on businesses. It is important that they consider the positive and negative impacts that mobile technologies have had. The evidence could be presented in the form of a report, a presentation with detailed speaker notes or a video of learners presenting to an audience, or a technical guide to help businesses make decisions with respect to implementing mobile technology in their business.

M2: Learners are required to examine the ethical implications of the use of mobile technologies. They could consider the ethical issues around monitoring locations, data sharing and costs. The evidence could be in the form of an information booklet, an article for a magazine or newspaper, a report or a presentation with detailed speaker notes.

LO3 Be able to determine solutions for the use of mobile technologies

P3: Learners are required to investigate the mobile technological requirements for an identified business need. Learners should be presented with a business scenario (although they could choose their own if they have identified a potential business). They should identify the business and give some background as to the functions of the business at the beginning of their evidence in order to 'set the scene'. The evidence can be in the form of a report or a presentation with detailed speaker notes (or a video of learners delivering the presentation), where learners present the results of their investigation into how the business could implement mobile technology, the types of technology that could be used, etc.

P4: Learners are required to plan a mobile technology solution for an identified business need. It is important that they document all aspects of planning as identified in the teaching content and consider the existing technologies within the identified business as part of their plan. The evidence could be in the form of a report to 'present' to the business for their consideration, or a planning document.

M3: Learners are required to prepare a technology business plan to support the implementation of the mobile technological solution for the business. The evidence will be the technology business plan.

LO4 Be able to present solutions for the use of mobile technologies

P5: Learners are required to promote the technological solution to relevant stakeholders and secure feedback. They will present their plan to the stakeholders for the business used in LO3. It is acceptable that there may not be an actual business available and therefore the teaching staff could undertake the role. Feedback should be recorded within their evidence. Learners could prepare a presentation with detailed speaker notes (or a video of them actually promoting the planned use to the stakeholder(s)). Evidence could also be presented as a formal report which would require accuracy with respect to spelling and grammar to ensure that it is fit for purpose.

P6: Learners are required to improve their proposed mobile technological solution based on stakeholder feedback. They must consider the feedback and identify how this feedback has influenced the improvements. Evidence should be the modified proposal and rationale for decisions made.

D2: Learners are required to predict the effectiveness of the mobile technological solution for the identified business need. The predictions should include some form of measurable value by which the effectiveness can be quantifiably judged. The evidence will be in the format of a report or presentation with detailed speaker notes.

Some providers for the industry qualifications offer quizzes, tests and assessments. Reference to these websites may support knowledge and learning.

www.comptia.org

Feedback to learners: you can discuss work-in-progress towards summative assessment with learners to make sure it's being done in a planned and timely manner. It also provides an opportunity for you to check the authenticity of the work. You must intervene if you feel there's a health and safety risk.

Learners should use their own words when producing evidence of their knowledge and understanding. When learners use their own words it reduces the possibility of learners' work being identified as plagiarised. If a learner does use someone else's words and ideas in their work, they must acknowledge it, and this is done through referencing. Just quoting and referencing someone else's work will not show that the learner knows or understands it. It has to be clear in the work how the learner is using the material they have referenced **to inform their** thoughts, ideas or conclusions.

For more information about internal assessment, including feedback, authentication and plagiarism, see the centre handbook. Information about how to reference is in the OCR *Guide to Referencing* available on our website: <http://www.ocr.org.uk/i-want-to/skills-guides/>.

EMPLOYABILITY SKILLS

Employability skills	Learning outcome
Communication	P1, P5, P6, M3
Problem solving/decision making	P4, M1
Time management	P4, P5, P6
Critical thinking	M2, M3, D1, D2

MEANINGFUL EMPLOYER INVOLVEMENT - a requirement for the Diploma (Tech Level) qualifications

The 'Diploma' qualifications have been designed to be recognised as Tech Levels in performance tables in England. It is a requirement of these qualifications for centres to secure for every learner employer involvement through delivery and/or assessment of these qualifications.

The minimum amount of employer involvement must relate to at least one or more of the elements of the mandatory units.

Eligible activities and suggestions/ideas that may help you in securing meaningful employer involvement for this unit are given in the table below.

Please refer to the *Qualification Handbook* for further information including a list of activities that are not considered to meet this requirement.

Meaningful employer involvement	Suggestion/ideas for centres when delivering this unit
1. Learners undertake structured work-experience or work-placements that develop skills and knowledge relevant to the qualification.	Learners could undertake work experience with businesses who use mobile technology or who are considering the use of mobile technology.
2. Learners undertake project(s), exercises(s) and/or assessments/examination(s) set with input from industry practitioner(s).	A local business can be invited to set the scenario for P2, to be the stakeholder for P5 and to provide the feedback for P6. Alternatively learners could visit businesses as part of their research.
3. Learners take one or more units delivered or co-delivered by an industry practitioner(s). This could take the form of master classes or guest lectures.	A local shop could send a member of staff to speak about how they use RFID for stock control and to deter theft.

To find out more

ocr.org.uk/it

or call our Customer Contact Centre on **02476 851509**

Alternatively, you can email us on **vocational.qualifications@ocr.org.uk**



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