

Unit 56: Digital Communication

Unit code:	M/600/6616
QCF Level 3:	BTEC National
Credit value:	10
Guided learning hours:	60

● Aim and purpose

This unit aims to provide learners with an understanding of modern digital communication systems, both person-to-person and to a wider audience. Learners are expected to use a variety of modern digital messaging techniques, and to prepare pages for a small website.

● Unit introduction

Businesses and individuals are developing new ways of communicating through instant messaging, Voice over Internet Protocol (VoIP) and weblogs (blogs). The internet is no longer limited to the desktop: millions of users access web pages through mobile devices (such as mobile phones). Large corporations, small and even home-based businesses all find websites and modern communication tools essential. Personal communication today demands at least the ability to use email plus an easy familiarity with mobile phone text messaging. The popularity of voiceover-internet both at home and in commerce is growing rapidly.

A wide range of digital communication systems is now available and an understanding of their functions and the devices required for their operation will allow learners to become confident and efficient communicators in future employment. The practice of modern communication techniques will allow learners to develop an insight into how these methods can be used creatively to transmit information and thoughts rapidly to audiences across the world.

An understanding of the means by which web pages are created for different purposes, published and hosted will enable learners to contribute effectively to the digital presence of future employers.

● Learning outcomes

On completion of this unit a learner should:

- 1 Understand digital communication systems
- 2 Be able to use digital communication techniques
- 3 Be able to produce a website.

Unit content

1 Understand digital communication systems

Communication protocols: worldwide web consortium (W3C); wireless technologies (3G, 4G, 5G); global system for mobile (GSM); 3rd generation protocols (3G); multimedia message service (MMS); general packet radio service (GPRS); Bluetooth; broadband (ADSL (Asymmetric Digital Subscriber Line), cable); Voice over Internet Protocol (VoIP); High Speed Packet Access (HSPA)

Methods: email; instant messaging (IM), eg messaging apps; short messaging system (SMS); multimedia messaging system (MMS); internet; bulletin boards; discussion forums; weblogs (blogs); newsgroups; internet telephony; conferencing (video conferencing, audio conferencing); conferencing via virtual communities, eg MMPRPGs (Massively Multiplayer Persistent Online Role-Playing Games), Second Life

internet services: worldwide web (www); internet service providers (ISP); uniform resource locator (URL); domain name; top level domain; domain name registration; hosting

Social web: social networking; information sharing; adding content, eg videos to YouTube, SketchUp models to Google Earth; tagging content

Appropriate language conventions: methods, eg web pages, email, texting, messaging; purposes (business, personal)

2 Be able to use digital communication techniques

Messaging systems: email; instant messaging (IM), eg Google Hangouts; short messaging system (SMS) (from mobiles, from PCs); multimedia messaging system (MMS)

Web communities: discussion forums; wikis; blogs; virtual learning environments (VLE); social networking, eg Facebook, Twitter; information sharing, eg Flickr, YouTube

Conferencing: audio conferencing; Voice over Internet Protocol (VoIP); video conferencing; conferencing via virtual communities, eg MMPRPGs, Second Life

Devices: wireless handheld devices (mobile phone, tablet); webcam; headsets; Bluetooth devices, eg laptops, mobile phones, headsets, conferencing software, eg Skype; games consoles; personal digital assistants, eg Siri, Cortana, Alexa

3 Be able to produce a website

Purpose: audience; device considerations (PC, mobile device, browser software)

Content: eg text, images, animation, video, sounds, music, social web content (social networking, information sharing)

Plan: page layout sketches (page design briefs, storyboards); site map; legal and ethical considerations; copyright permissions; wireframes

Structure: site structure, eg index page, linked content pages; page layout, eg consistency, heading style, body style, colour scheme; folder management (images sub-folder); page naming conventions; template; style sheets; hyperlinks; page structure, eg head, body, metatags

Software: hypertext markup language (HTML); cascading style sheets (CSS); text editor, eg Notepad; visual editor, eg Dreamweaver

Testing: accessibility; code; link; spelling; preview; documented test results

Upload: file transfer protocol (FTP)

Reflective practice: finished product (compared with original intentions, fitness for purpose, technical qualities, aesthetic qualities, content, style); production skills; ideas generation; planning; preparation; workflow and time management; technical competence; project management; monitoring work in progress; creative ability; own work; teamwork; self-evaluation; comments from others, eg audience, peers, tutors, client; documentation, eg notes, sketches, storyboards, production logs

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P1 describe protocols, devices and methods used in digital communication systems with some appropriate use of subject terminology [IE]	M1 explain protocols, devices and methods used in digital communication systems with reference to detailed illustrative examples and with generally correct use of subject terminology	D1 comprehensively explain protocols, devices and methods used in digital communication systems with elucidated examples and consistently using subject terminology correctly
P2 use digital communication systems with some assistance	M2 use a range of digital communication systems competently with only occasional assistance	D2 use a wide range of digital communication systems with a high degree of proficiency and skill, working independently to professional expectations
P3 produce a website with some assistance. [CT; RL; SM]	M3 produce a website to a good technical standard with only occasional assistance.	D3 produce a website to a technical quality that reflects near-professional standards, working independently to professional expectations.

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

This unit gives learners an insight into modern digital communication methods, both personal and corporate. Successful teaching of the unit requires a blend of tutor-led lectures and practical sessions and individual learner research and reading. Research will include using the internet as well as making extensive use of a range of communication systems. Learners will need to compose, send and receive messages using all the techniques specified in the unit content. Centres are advised to ensure their network system permissions will allow such use by learners.

The study of protocols, devices and methods covered by learning outcome 1 might be interspersed with the practical composition, sending and receipt of messages covered by learning outcome 2. Learners could record such activities as participation in conferencing and active contribution to an online community in a blog or wiki. This could lead naturally to their study of internet services and social web which can be implemented in their production of a website.

Discussion of protocols might be taught through lectures and directed personal research, but wherever possible it is expected that learners will be given the opportunity to use a wide range of the digital messaging systems available, including text-based, audio and video. Consideration must be given as to the language conventions appropriate to the purpose of the communication. While 'CU L8r' might be an accepted convention for a personal text to a friend, it would not be acceptable in most circumstances in a formal business email.

Tutors could use email to communicate group instructions to learners who could respond with messages including attachments of assessment work. Tutors could make their classes into local 'learning communities' to encourage and control messaging between their learners. Some lecture material could be provided only via the messaging systems and occasional lectures could be given through conferencing at mutually agreed times, perhaps by guest lecturers speaking from a remote address. Learners could themselves make remote presentations using conferencing facilities, where 'remote' might be understood to be a neighbouring classroom, although this also lends itself to the possibility of cooperation between centres. Learners could be encouraged to reserve email folders for archival recording of their email use, and could record their VoIP and conferencing activity using screen and audio capture software. Personal learning logs could be stored within a blog on a learner's personal file area, and a class group could contribute to a locally held wiki explaining media topics. This practical sharing of knowledge across a localised learning community could lead to a better understanding of how online communities operate globally.

Some centres may be able to make web space available where learners can publish their websites, but all learners should investigate providers of web space for commercial entities and examine their rules. Some learners may choose to request free web space and may wish to upload their website pages for family and peers to comment on. Centres may need to investigate permissions for using file transfer protocol to upload learner site content to free hosts, though many ISPs provide their own web-based transfer methods. Additionally, as many centres employ surf-control software, it may be necessary to investigate whether free web space providers are permitted.

Most centres will wish to use web page editing software to help learners prepare their web pages, but even where such software use is planned, a simple and brief exploration of basic HTML codes is recommended. This will enable discussion of the structure of a web page and clarify the purpose of the editing software. The study of code can often begin by viewing the source of existing web pages before continuing to prepare trial pages in a text editor for upload to the browser. Use of the text editor can focus attention on the function of the HTML before web page production using web-editing software. Some thought should

also be given to the devices on which the pages are likely to be viewed and the difference between creating a web page to be viewed on a PC and on a mobile device.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way of planning the teaching and assessment of this unit.

Topics and suggested assignments and activities
Introduction to unit and unit assessment.
Lectures, class discussions and learner exploration of: <ul style="list-style-type: none">• text-based communication systems and language conventions• video and audio-based communication systems• social web devices.
Practical sessions using communications systems.
Lecture and research on website protocols.
Assignment 1 – Digital Communications Systems
Learners will contribute to a Virtual Learning Environment explaining and demonstrating uses of digital communication systems.
Learners must provide: <ul style="list-style-type: none">• information on protocols, devices and methods• evidence of use of systems, eg diary of use, video recording of webcam conversations, screenshots of usage etc.
Building skills in use of web authoring tools: <ul style="list-style-type: none">• creating content• site structure• software• testing.
Introduction to (or review of) ideas generation and planning.
Assignment 2 – Website to Promote a Film Club
Learners will: <ul style="list-style-type: none">• consider and interpret the brief• generate and record ideas• find suitable assets and document their locations• consider the legal and ethical implications of their proposed work• carry out planning activities prior to production• undertake production workshop sessions following their planned ideas• test and improve a draft version• publish the website• present work to peers• compile a development blog evidencing their creative work and reviewing their own website.

Topics and suggested assignments and activities

Unit learning and assessment review.

Assessment

Evidence for assessment

Evidence for achievement of learning outcomes 1 and 2 is likely to be in the form of a blog or wiki though evidence of learners' use of communication systems could also be a paper-based portfolio of emails and message transcripts, video or audio recordings of learners using the devices or recordings from screen.

It is expected that learners will be given the opportunity to experience a wide range of the digital messaging systems available. As a minimum, learners should show evidence of using text-based digital communication systems, audio and video communication, and of both PC-based and mobile devices.

The website constructed by the learner as evidence for achievement of learning outcome 3 should be sufficient to permit evidence of a range of content, though the site does not need to be extensive. Around four to six pages is suggested but these could include cut-down duplicate pages for use on a mobile device. The site must be supported by documentation evidencing planning to meet purpose and audience expectation – design briefs (layout sketches) for each page, and a production log recording daily production activities, problems and solutions. The page source should be provided to evidence correct coding, together with a site map or other report showing systematic testing to ensure absence of broken links.

It is not a requirement that learners' sites be uploaded to the worldwide web, though this will add realism to the assignment.

For some elements of this unit, and for some learners, a formal viva voce assessment might be appropriate. When more than one learner in a cohort is assessed in this way, care must be taken to ensure that all learners are asked equivalent questions, and that all are given equal opportunities to expand or clarify their answers. Interviewers must also ensure that questions are not phrased in such a way as to provide or suggest an answer. Formal vivas should be recorded for the purposes of internal and external verification and at least 50 per cent of such assessments must be internally verified.

Application of grading criteria

When applying the grading criteria, tutors should follow the advice given below. Please note that any examples of evidence given here are indicative only. This advice is not exhaustive and the examples need not specifically be included in a learner's work in order for that learner to achieve the exemplified grade.

Pass

To achieve a pass grade, learners must achieve all the criteria at pass level. For each of the criteria learners must present evidence that addresses each italicised sub-heading of the content for the learning outcome.

P1: learners will provide basic though correct and substantially complete descriptions, though the description of protocols, devices and methods will be discrete and will not be related to examples of communication systems and their use. Evidence will show a basic understanding of technical terminology but learners will generally be unsure about this vocabulary and will make fairly frequent mistakes when they do use it. A pass grade learner might note, 'Text and pictures can be sent using email or by messaging services. You can also send them from a mobile using SMS (short messaging service) and MMS (multimedia messaging service).'

P2: as a minimum, learners should evidence use of text-based digital communication systems, audio and video communication, and both PC-based and mobile devices, though the use will be cursory and will not reveal an appreciation of purpose. There will be records of use in the form of video or audio recordings, screenshots, personal logs, blogs, wikis etc. Learners will have required assistance from tutors to prepare their documents.

P3: learners will produce a basic but non-trivial site of four to six linked pages. There should be no broken links within the pages presented, though external links will not be fully operational. However, code for such external links must be checked for accuracy. For this unit no consideration is taken of aesthetic quality of page design, but text colour and font sizes must be chosen to permit text to be readable, eg dark blue text should not be presented over a black background. Text must not be obscured by images. Learners will present a design layout for each page. The production log must be present but will be sketchy and presented as brief, discrete statements. At pass grade a typical page layout may be sketchy and perfunctory, lacking detail and awareness of the purpose of the layout brief. Page content will be restricted to text and image, and metatags be missing or inappropriate. There will be no evidence of the import of content originating from differing software applications. Individual pages will be treated as discrete entities, with no attempt to apply a consistent style across all pages in the site. Images will not be optimised and aligned against text.

P2 and P3: when engaged in practical activities, pass grade learners will need frequent assistance and support, though they will take note of and make use of this help when it is given. If they are in frequent need of such help but fail to make positive use of it, they should not be considered for a pass grade for this unit.

Merit

To achieve a merit grade, learners must achieve all the pass and all the merit grade criteria. For each of the criteria learners must present evidence that addresses each italicised sub-heading of the content for the learning outcome.

M1: learners will use detailed examples in their descriptions of protocols, devices and methods revealing a depth of understanding of appropriate devices and protocols for the various methods. Learners will use technical vocabulary for the most part correctly, but may make mistakes or be unsure about usage at times. For example, a learner might note, social web is a term which is used to describe the new generation of websites which typically feature greater user interaction, for example the ability for users to leave comments and give feedback, and to share content. Popular examples are users sharing and tagging photos using Flickr and uploading videos to YouTube for other users to comment on.'

M2: learners will evidence competent use of a range of the techniques and devices listed in each content area. Records of use in the form of video or audio recordings, screenshots, personal logs, blogs, wikis or other, will be full and reveal a systematic, thoughtful attention to gathering the necessary evidence. The application of the methods will have been correct and will have required only occasional assistance. Evidence will be provided in the form of a log supported by screen dump or video or audio capture.

M3: learners will produce a non-trivial website of four to six fully linked pages, following well-prepared plans and page design briefs. The website will demonstrate appropriate use of a range of the unit content. Some limited support may have been required to complete functionality of the website. Work will have been approached methodically and will show some facility and confidence in handling manual coding or web-editing software. The site and associated documentation will reveal care and thought. Systematic testing of spelling and internal and external links will be clearly evidenced. The production log will be presented as a narrative discussing major events in the development of the website.

M2 and M2: when engaged in practical activities, learners will need occasional support, particularly when dealing with more complex technology or trying to apply more sophisticated techniques. Like the pass grade learner, they will benefit from such support.

Distinction

To achieve a distinction grade, learners must achieve all the pass, all the merit and all the distinction grade criteria. For each of the criteria learners must present evidence that addresses each italicised sub-heading of the content for the learning outcome.

D1: learners will demonstrate thorough knowledge of digital communication systems, correctly relating protocols, devices and methods through extended examples which are fully elucidated to show how they carry the point being made. Explanations will be given which are free from confusion or ambiguity, drawing out of the examples precisely those aspects that exemplify the point under discussion. Technical vocabulary will be secure and used correctly and confidently at all times. A learner might note, for example, 'Many businesses and home users employ Voice over Internet Protocol (VoIP) for national and international voice communication. VoIP is the ability of an IP network to carry telephone voice signals as IP data packets. VoIP enables a router (a device which transfers data between networks on the internet) to transmit telephone calls over the internet, though quality does depend on speed of hardware systems employed. Simply put, VoIP means using the internet as the transmission medium for telephone calls. One advantage of VoIP is that telephone calls over the internet between users on the same VoIP provider do not incur a surcharge beyond what the user is paying for internet access, much in the same way that the user doesn't pay for sending individual emails over the internet, nor is there an additional charge to communicate internationally (on the same provider) since the internet is available worldwide. A major disadvantage is that emergency calls cannot easily be directed to the appropriate local emergency call centre.'

D2: learners will evidence confident and skilful use of a wide range of the systems and devices listed in the content, using each fluently and providing comprehensive evidence of extended use through records in the form of video or audio recordings, screenshots, personal logs, blogs, wikis etc. They will demonstrate the appropriateness of choice for the messaging techniques selected. For example, the mobility of SMS might be selected for messages sent and received whilst in transit between locations, while a history of contributions to learning community forums and wikis (even if locally hosted) might be demonstrated showing improvement in understanding of an academic topic over an extended period of time. Distinction grade learners will have created evidence autonomously, possibly using a personal blog or wiki, independently seeking opportunities to create effective evidence and collating this evidence without constant support or supervision.

D3: learners will create an effective non-trivial website of four to six pages, demonstrating correct and appropriate application of a wide range of content. The website documentation will be complete. Learners will have been self-motivated and independent in preparation of their evidence. Page layout sketches will be thorough and reusable by other developers, and will identify content source locations. Evidence will clearly show that learners can successfully import and manipulate content from a range of other software, if necessary performing additional pre-processing outside the web editor. This could be achieved by a screen dump of folder contents, showing file types, or by innovative use of screen-capture software. Learners will be able to show their manipulation of the imported content within the page to match the design brief, again possibly by screenshot or capture software. Near-professional levels of technical skills in manual coding or software use will be evident in the extended choice of available HTML techniques applied within the website. Sites will be ready for upload, and there will be documentation of systematic and thorough testing. The production log will be a comprehensive, fluent and detailed account of all activities involved in the creation of the site.

D2 and D3: in all practical activity distinction grade learners will be capable of working autonomously and effectively. The term 'working independently' means that they are able to work on their own initiative, do not need constant support or supervision, give the work their full commitment, work positively and cooperatively with others, and meet deadlines. In other words, they have the kind of self-management skills that would be expected of them in a professional context.

Note also that this criterion should not be taken to mean that learners do not seek advice or that they work without discussing things with their tutor, but rather that they are not dependent upon the support of others and that when they take advice they weigh it carefully for themselves.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, M1, D1 P2, M2, D2	Assignment 1 – Digital Communications Systems	Contribution to a Virtual Learning Environment explaining and demonstrating uses of digital communication systems.	<ul style="list-style-type: none"> • Blog explaining uses of digital communication systems. • Evidence of individual learner’s use of digital communication systems, eg video, audio recordings, screenshots. • Tutor observation records.
P3, M3, D3	Assignment 2 – Website to Promote a Film Club	Brief from a local independent cinema to provide a microsite promoting a film club and keeping members informed of upcoming movies, with content accessible via both PC and mobile.	<ul style="list-style-type: none"> • Final product uploaded to web. • Production documentation. • Testing reports. • Reflective development blog.

Links to other BTEC units

This unit forms part of the BTEC Creative Media Production suite. This unit has particular links with the following units in the BTEC Creative Media Production suite:

Level 2	Level 3
	Interactive Media Authoring
	Web Authoring
	Web Animation for Interactive Media

Essential resources

Learners will require access to a variety of modern digital messaging techniques. Network permissions may need to be set to permit learner access and contribution to forums, blogs and wikis, though centres may wish to create local in-house variants. VoIP software and permissions are required, as is access to video conferencing software and systems. These need not be highly sophisticated – commonly available webcams and software may suffice.

Learners will need to have personal email accounts, and email archival storage space.

Employer engagement and vocational contexts

Centres should develop links with local businesses which could be approached to provide visiting speakers and study visits.

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are ...
Independent enquirers	<ul style="list-style-type: none"> planning and carrying out research into digital communication systems carrying out research to develop ideas for their website
Creative thinkers	<ul style="list-style-type: none"> generating ideas and exploring possibilities for websites trying out alternative ways of constructing their website, and following ideas through to complete a website adapting their ideas as circumstances change
Reflective learners	<ul style="list-style-type: none"> reviewing and reflecting on their production of a website and acting on the outcomes to modify and improve their work setting goals with success criteria for their production work inviting feedback on their own work and dealing positively with praise, setbacks and criticism evaluating their experiences and learning to inform future progress
Self-managers	<ul style="list-style-type: none"> organising time and resources and prioritising actions when producing a website and blog, whether working on their own or in a group seeking out challenges or new responsibilities and showing flexibility when priorities change dealing with competing pressures, including personal and work-related demands responding positively to change, seeking advice and support when needed.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are ...
Team workers	<ul style="list-style-type: none"> collaborating with others to use digital communication systems or produce a website taking responsibility for their own role when working in a group managing discussions to reach agreements and achieve results.

● Functional Skills – Level 2

Skill	When learners are ...
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	handling web authoring systems and blogs using digital communication systems
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	planning for the authoring of a website
Manage information storage to enable efficient retrieval	managing assets sourced and created, and pages created, for their website and blog
Follow and understand the need for safety and security practices	using digital communication systems
Troubleshoot	testing their site
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	sourcing assets for their website and blog
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	researching asset types and protocols for use with web authoring tools using digital communication systems
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: <ul style="list-style-type: none"> • text and tables • images • numbers • records 	building and presenting their project portfolio and blog showing: <ul style="list-style-type: none"> • interpretation of the brief • generation of ideas • documentation and management of chosen assets • consideration of legal implications • review of own work
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	
Evaluate the selection and use of ICT tools and facilities used to present information	preparing a blog on the use of digital communication systems
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	using digital communication systems

Skill	When learners are ...
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	<p>taking part in brainstorming sessions to generate ideas as a response to a creative brief</p> <p>communicating via digital communication systems</p>
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	<p>reviewing literature and websites to find information about digital communication systems</p>
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	<p>creating a blog about digital communication systems</p> <p>writing down ideas and notes</p> <p>creating production documentation and testing reports</p> <p>writing reflective reviews.</p>