UNIVERSITY of CAMBRIDGE
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Scheme of work – Cambridge IGCSE® Computer Studies (US) 0441

Unit 2: The social and economic implications of the use of computers

Recommended prior knowledge
Students need to have studied Unit 1 *The range and scope of computer applications* before beginning this unit.

Context
This unit builds on the work done in Unit 1 and looks at the effects of using a range of computer applications. The unit could be taught directly after Unit 1 or later in the course to review and extend the work. For both units, *Computer Studies Support Booklet – Part 1* (http://teachers.cie.org.uk/docs/dynamic/31796.pdf) provides notes on section 1 of the syllabus and practice problems (with answers in *Computer Studies Support Booklet – Answers* (http://teachers.cie.org.uk/docs/dynamic/31801.pdf).

Outline
Review the applications studied in Unit 1 to gain a broad knowledge of the economic reasons for, consequences of, and health and safety aspects of the use of computerised systems; changes in employment and re-training; privacy and integrity of data; data protection legislation; hacking and other computer crime; computer viruses; Internet security and usage; security and reliability, including consequences of system failure. Develop critical abilities in balancing the benefits and drawbacks of a computerised system to formulate a reasoned view of the potential effects of any suggested application or development.

Syllabus ref	Learning objectives	Suggested teaching activities	Learning resources
1.2.1	Social and economic effects on people and organisations associated directly with the application, on other individuals and organisations, and on society in general	Through case studies such as banking, shopping or manufacturing, drawn from the applications studied in Unit 1, students identify advantages and disadvantages of the use of those applications and their impact on society, including: • de-skilling brought about through the replacement of skilled and semiskilled labour by microprocessor-controlled systems in manufacturing • ability to site operations anywhere in the world, e.g. call centres, online retailing, design services • benefits to unions and to management of "new technology" agreements leading to greater productivity and better working conditions • economic reasons for using computerised systems • changes to existing methods and services and the changes to the	LWS coursebook pp. 216–20 CD of notes from the former website www.theteacher99.btinternet.co.uk/theteacher includes identification of advantages and disadvantages of a hospital control system www.teach-ict.com/gcse/theory/social/student/shome_society.htm Theory notes, activities and quizzes for social effects www.bbc.co.uk/schools/gcsebitesize/ict/implications/2workpatternsrev3.shtml Better quality products

Syllabus ref	Learning objectives	Suggested teaching activities	Learning resources
		working environment because computerised systems are used • health and safety aspects of using computers in the workplace.	www.bbc.co.uk/schools/gcsebitesize/ict/implications/2workpatternsrev4.shtml Effects of e-commerce on businesses www.cedar.u-net.com/ict6/demoidx.htm Search for: • **banking** and select an article on reasons for computerising it • **health safety**
1.2.2	Changes in employment, re-training	Through case studies such as banking, handling and producing documents in offices, or manufacturing, drawn from the applications studied in Unit 1, students identify: • re-training needs for staff as computerised systems are introduced and upgraded • opportunities for, and benefits of, the use of multimedia training packages for individual use on CD-ROM or DVD.	LWS coursebook pp. 217–9, 221 www.bbc.co.uk/schools/gcsebitesize/ict/implications/2workpatternsrev1.shtml Introduction to changes in work patterns CD of notes from the former website www.theteacher99.btinternet.co.uk/theteacher includes advantages of CAL
1.2.3	Privacy and integrity of data	Students identify methods required to ensure data are protected from: • hackers (e.g. by passwords, firewalls) and • from corruption or loss.	LWS coursebook pp. 221–223 www.bbc.co.uk/schools/gcsebitesize/ict/databases/6datasecurityrev1.shtml Introduction to data security www.cedar.u-net.com/ict6/demoidx.htm Search for **security** CD of notes from the former website www.theteacher99.btinternet.co.uk/theteacher includes details of methods of system security www.teach-ict.com/news/news_stories/news_dataloss.htm News articles on data loss
1.2.4	Data protection legislation	Students identify the features expected in a data protection act, such as data must be obtained lawfully, data must be accurate and data must be kept up-to-date. They can usefully compare these with the features of the data protection law in their own country.	LWS coursebook pp. 224–5 www.ico.gov.uk/for_organisations/data_protection/the_guide.aspx Information about the UK's Data Protection Act written for

Syllabus ref	Learning objectives	Suggested teaching activities	Learning resources
			organisations that control other people's personal data (includes a link to a 92-page downloadable *Guide to Data Protection*, of which Part C is most useful)
1.2.5	Security and reliability; the consequences of system failure	Introduce the varying requirements for security and reliability using contrasting examples. For example, a system failure during a batch update of a sequential master file is irritating and will cause delay, whereas a failure in an air traffic control system could well have catastrophic results.

Other examples could be drawn from case studies, such as control of chemical/nuclear plant or monitoring of patients in a hospital. | LWS coursebook pp. 223–4

www.v3.co.uk/search
Search this UK IT news website for articles on **outage** (system failure), **air traffic control**, **power station**, etc. |
| 1.2.6 | Hacking and other computer crime | Introduce the idea of computer crime:
• includes activities such as the cracking of ineffective security systems in order to gain unauthorised access (commonly known as hacking) to commercially sensitive or confidential personal files and fraud through the improper transfer of funds from one account to another
• computer criminals may work within the organisation or may be outsiders
• measures taken to combat computer crime include physical security, development of complex security codes and systems, encryption of sensitive data, and monitoring of all attempts to access the system, whether successful or not
• security systems include the use of smart cards that are slotted into the side of a keyboard and prevent access unless the PIN typed in matches the one stored on the chip and other electronic devices (e.g. passports and security passes contain a chip and/or loop circuit recognised by an electronic reading device). | LWS coursebook pp. 225–7

CD of notes from the former website www.theteacher99.btinternet.co.uk/theteacher includes computer crime

www.cedar.u-net.com/ict6/demoidx.htm
Search for **security measure** |
| 1.2.7 | Computer viruses | Students identify:
• what is included in the term 'malware', of which virus is one type
• the effects of malware, including viruses, on a computer system
• how to guard against malware, including viruses (e.g. use of appropriate anti-virus software, firewalls). | LWS coursebook pp. 227–9

www.howstuffworks.com/search.php
Search for **malware**

www.teach-ict.com/news/news_stories/news_virus.htm
News articles on malware

www.teach-ict.com/gcse/theory/virus/student/shome_virus.htm
Viruses |

Syllabus ref	Learning objectives	Suggested teaching activities	Learning resources
			www.bbc.co.uk/webwise/topics/safety-and-privacy/safety-online/ A collection of articles including guarding against malware

1.2.8	Internet security and usage	Students identify:
		• potential problems with Internet use, for example:
		  • malware, including viruses
		  • hacking
		  • spam
		  • spyware
		  • cookies
		  • phishing
		  • pharming
		• developments in the use of the Internet, for example:
		  • wikis
		  • social networking
		  • blogs
		  • digital media sharing websites
		  • web browsers
		  • ISPs
		  • tagging
		  • podcasts
		  • bit streaming
			LWS coursebook pp. 230–6
			
			www.teach-ict.com/gcse/theory/internet/miniweb/pg8.htm
			Issues with the internet
			
			www.howstuffworks.com/search.php
			Search for **spam**, **spyware**, **cookies**, **phishing**, **wikis**, **social network**, **blog**, **media sharing**, **web browser**, **ISP**, **podcast**, **stream file**