

Cambridge **TECHNICALS LEVEL 3**

**IT**

Cambridge  
**TECHNICALS**  
**2016**

**Unit 19**

**Computer systems – software**

M/507/5022

Guided learning hours: 60

Version 3 July 2017

## LEVEL 3

### UNIT 19: Computer systems - software

M/507/5022

**Guided learning hours:** 60

**Essential resources required for this unit:** Learners should have access to a range of operating systems, application software and utility software. Systems should be made available, allowing learners to install and upgrade a wide range of software to include operating systems, application software and utility software. Maintenance activities will require learners to have access to utilities such as anti-virus, registry cleaners, defragmentation tools etc.

**This unit is internally assessed and externally moderated by OCR.**

#### UNIT AIM

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Computer systems rely on the combination of hardware and software to work effectively together to support the needs of all types of users, whether it is for business or an individual. Software comprising of operating systems and application software needs to be installed, configured and maintained correctly in order for the systems to remain efficient. This unit will help you to develop your knowledge, skills and understanding to successfully install or upgrade a wide range of software, including operating systems and application software. It will enable you to select and use appropriate utility software to carry out maintenance activities. In addition, you will be able to ascertain end user requirements in order to plan and carry out installation, upgrades and/or maintenance activities.

This unit is optional to the IT Infrastructure Technician specialist pathway due to its relevance in an IT technical environment. The unit supports the development of skills, knowledge and understanding relevant to a technical support or network technician job role. The unit is also an optional unit within the Emerging Digital Practitioner specialist pathway as the job roles in this field often require the development and installation of bespoke software applications such as creating software applications to accommodate the collection and manipulation of data or creation of software for use within mobile technology.

The learning in this unit will also support the delivery of the CompTIA A+, the CompTIA Mobility+ qualification objectives, as well as the Cisco ITE qualification.

## 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 different software installations and their purpose	1.1 Systems software, i.e.: <ul style="list-style-type: none"> <li>• operating systems:               <ul style="list-style-type: none"> <li>○ open (e.g. Linux)</li> <li>○ closed (e.g. Windows)</li> </ul> </li> <li>• utility programs</li> <li>• library programs</li> <li>• translator software</li> </ul> 1.2 Application software, i.e.: <ul style="list-style-type: none"> <li>• general purpose (e.g. off the shelf software such as Microsoft Office)</li> <li>• special purpose (e.g. payroll software)</li> <li>• bespoke (e.g. written specifically to meet a particular client's needs)</li> </ul> 1.3 Reasons for installation or upgrade, i.e.: <ul style="list-style-type: none"> <li>• improvement to system (e.g. stability, performance, security, productivity)</li> <li>• resolve issues (e.g. viruses, conflicts etc.)</li> <li>• address risks (e.g. loss of data, loss of service, system downtime, costs)</li> <li>• security risks (e.g. prevention, rectification)</li> <li>• access to additional features/functions</li> <li>• support installation of new hardware</li> <li>• address end user requirements</li> </ul> 1.4 Carry out maintenance activities

Learning outcomes	Teaching content
The Learner will:	Learners must be taught:
	<p>1.5 Types of installation, i.e.:</p> <ul style="list-style-type: none"> <li>• creating image/ghosting (e.g. make a copy of the hard drive configuration and software)</li> <li>• unattended installation</li> <li>• upgrade</li> <li>• clean install</li> <li>• repair installation</li> <li>• multi-boot</li> <li>• remote network installation</li> <li>• image deployment</li> <li>• Windows networking</li> <li>• Mobile device networking connectivity and email</li> </ul>
<p>2. Be able to implement software installations and upgrades to meet specified user requirements</p>	<p>2.1 Software installation/upgrade considerations, i.e.:</p> <ul style="list-style-type: none"> <li>• end user requirements</li> <li>• other stakeholder requirements (e.g. management)</li> <li>• costs</li> <li>• existing configuration and software</li> <li>• service level agreement (SLA)</li> <li>• software licensing: <ul style="list-style-type: none"> <li>○ end user license agreement (eula)</li> <li>○ freeware</li> <li>○ shareware</li> <li>○ open source</li> </ul> </li> <li>• system requirements: <ul style="list-style-type: none"> <li>○ minimum specification</li> <li>○ recommended specification</li> </ul> </li> <li>• timescales including permissible downtime <ul style="list-style-type: none"> <li>○ risks involved (e.g. incompatibility issues, system downtime, loss of data and/or service, additional costs)</li> <li>○ risk minimisation actions (e.g. backups, testing, low risk downtimes for installation)</li> </ul> </li> <li>• type of installation</li> <li>• methods and data related to mobile device synchronisation</li> </ul> <p>2.2 Work plan, i.e.:</p> <ul style="list-style-type: none"> <li>• end user requirements</li> <li>• system specification</li> <li>• current system software</li> <li>• current system configuration</li> <li>• backup of system required</li> <li>• software to be installed</li> <li>• installation type</li> <li>• license requirements/legislative requirements</li> <li>• security risks</li> <li>• compatibility requirements</li> <li>• configuration requirements</li> <li>• timescales</li> <li>• test plan (i.e. test no, date, test, expected result, actual result, resolution, re-test no)</li> </ul>

Learning outcomes	Teaching content
The Learner will:	Learners must be taught:
<p>3. Be able to conduct system maintenance using utility software</p>	<p>3.1 Maintenance plan, i.e.:</p> <ul style="list-style-type: none"> <li>• date</li> <li>• system description</li> <li>• maintenance activity</li> <li>• benchmark information (prior to maintenance activities and post maintenance activities) <ul style="list-style-type: none"> <li>○ benchmarking software e.g.: SiSoft Sandra Lite, Futuremark, PCMark 8, HyperPi, Phoronix Test Suite (Linux), Passmark Performance Test</li> </ul> </li> <li>• licensing requirements/legislative requirements</li> <li>• security risks</li> <li>• backup requirements</li> <li>• software to be used</li> <li>• benefit to system</li> <li>• configuration requirements</li> <li>• testing</li> <li>• activities to be automated</li> </ul> <p>3.2 Maintenance activities, i.e.:</p> <ul style="list-style-type: none"> <li>• virtual memory settings</li> <li>• defragmentation of drives</li> <li>• registry cleaning</li> <li>• removal of unwanted: <ul style="list-style-type: none"> <li>○ data files</li> <li>○ installation files</li> <li>○ start-up programs</li> <li>○ service settings</li> </ul> </li> <li>• cleansing of internet history, temporary and cached files</li> <li>• automatic software updates</li> <li>• automatic anti-virus and spyware scanning</li> <li>• utilities (e.g. scan disk, clean disk)</li> </ul> <p>3.3 Benefits of maintenance activities, i.e.:</p> <ul style="list-style-type: none"> <li>• improvements to system <ul style="list-style-type: none"> <li>○ boot time</li> <li>○ processing speed</li> <li>○ security</li> <li>○ stability of system</li> <li>○ storage capability</li> <li>○ memory usage</li> </ul> </li> <li>• benchmarking</li> </ul> <p>3.4 Maintenance evaluation, i.e.:</p> <ul style="list-style-type: none"> <li>• analysis of results</li> <li>• comparison with identified benchmarks</li> <li>• identified issues and potential resolutions</li> <li>• future considerations</li> <li>• documentation of activities</li> </ul>

## 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 different software installations and their purpose	P1: Explain the purposes of different systems software	M1: Compare the features and functions of different system software	
	P2: Outline the different application software available for end users		
	P3: Describe the reasons for carrying out software installations and upgrades		D1: Assess different types of software installations
2. Be able to implement software installations and upgrades to meet specified user requirements	P4*: Create work plans for software installations and upgrades to meet specified business requirements <i>(*Synoptic assessment from Unit 1 Fundamentals of IT, Unit 2 Global information and Unit 3 Cyber security)</i>	M2: Justify the considerations identified within the work plans for specified software installations and upgrades	
	P5: Carry out software installations and upgrades to meet specified business requirements		
	P6: Conduct system testing for software installations and upgrades		
3. Be able to conduct system maintenance using utility software	P7: Plan maintenance activities for a specified system	M3: Document the benefits of maintenance activities within the maintenance plan for the specified system	
	P8: Implement maintenance activities for the specified system		D2: Evaluate implemented maintenance activities for the specified system, post maintenance activities

## SYNOPTIC ASSESSMENT

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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

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### LO1 Understand different software installations and their purpose

**P1:** Learners are required to explain the purpose of the different systems software as identified in the teaching content. The evidence could be presented as a report, part of a technical guide or a presentation (either videoed or with detailed speaker notes).

**M1:** Learners are required to compare the features and functions of a range (three or more) of different systems software. This can be an extension of P1, but the comparisons must include any similarities and differences between the different software. The evidence could be presented as a report, part of a technical guide or a presentation (either videoed or with detailed speaker notes).

**P2:** Learners are required to outline the different application software available to end users. The outlines must cover general purpose, special purpose and bespoke, and include an account of the purpose of each application software category as well as the purpose for the example of each category type selected. The evidence can be in the form of a report, a presentation (either videoed or with detailed speaker notes) or as a teacher resource.

**P3:** Learners are required to describe the reasons for carrying out software installations and upgrades. The outline should include a description of each of the reasons (using examples), which includes the main characteristics/points. The evidence could be in the form of a presentation (either videoed or with detailed speaker notes), report, or information sheet.

**D1:** Learners are required to assess different types of software installation. The discussions should include a variety of ideas and arguments as to why certain types of software installation are more appropriate than others. Learners should discuss at least five of the types of software installation and include examples of where and how they are used. The evidence could be in the form of a technical guide, report or presentation (either videoed or with detailed speaker notes).

### LO2 Be able to implement software installations and upgrades to meet specified user requirements

It is important that learners are provided with a scenario, equipment and software that will enable them to install a wide range of software which must include operating system, application software, and utility software and include a software upgrade (the upgrade may be as a result of installing the operating system and/or utility software).

**P4:** Learners are required to examine the given scenario and create a work plan for the installation and upgrading of software to meet the specified user requirements. It is important that the work plans include the items in the teaching content to ensure that all aspects of the installation process have been considered. The test plan should also include relevant tests that would be carried out during and/or after installation/upgrade has taken place. A system should be tested after each installation to test functionality prior to implementing further installations. The evidence will be the work plans for the installations and upgrades. Learners could link this to a project that they are carrying out for the project management unit.

**M2:** Learners are required to justify the considerations that they have taken into account when preparing their installation plans. The justification should present a reasoned case for the decisions made. The evidence could be in the form of a report or presentation (either videoed or with detailed speaker notes).

**P5:** Learners are required to carry out the software installations and upgrades by following the work plans they produced for P4. It is acceptable for learners to make adjustments to their work plans during the installation and/or upgrade process, should they identify any unforeseen issues. They must, however, document these changes and provide an explanation as to why these changes were made. Their evidence could be in the form of a detailed witness statement supported by any documentary evidence e.g. completed work plans, video of installations and/or upgrades taking place, photographs etc.

**P6:** Learners are required to carry out system testing during and following each installation and upgrade. These tests must test the functionality of the system and not just the functionality of the software itself. The evidence will be the completed test plans.

### **LO3 Be able to conduct system maintenance using utility software**

It is important that learners are provided with scenarios, equipment and software that will enable them to meet the assessment criteria. Learners should have access to utility software which is “built in” to the operating system in use, as well as additional utility software which they may have installed for LO2. If learners are going to work towards the distinction criterion, they will need to benchmark the system prior to carrying out the maintenance activities in order to evaluate the improvements made.

**P7:** Learners are required to plan maintenance activities for a specified system. Learners must produce a maintenance plan to include the sections identified within the teaching content. The test plan should be completed during and after the maintenance activities and not completed retrospectively. The evidence will be the maintenance plan and test plan.

**M3:** Learners are required to document why the maintenance activities identified in the work plan produced for P7 will benefit the functionality of the specified system. The documentation should include the purpose or reason for each of the activities, as well as how this would benefit the system. The evidence could be in the form of a report, technical guide or presentation (either videoed or with detailed speaker notes).

**P8:** Learners are required to implement the maintenance activities for the system that they have identified within their maintenance plan created in P7. It is acceptable for learners to make adjustments to their maintenance plans during the maintenance activities, should they identify any unforeseen issues. They must, however, document these changes and provide an explanation as to why these changes were made. Their evidence could be in the form of a detailed witness statement supported by any documentary evidence e.g. completed maintenance plans. They must also include evidence of testing which must include the completed test plans. Additional evidence could be from photographs, printouts of tests etc.

**D2:** Learners are required to evaluate the effect that the implemented maintenance activities have had on the system after the maintenance activities have been completed. Learners should be able to carry out benchmark tests on the current system and compare them with the benchmark information taken prior to the maintenance activities occurred. Learners should make qualitative judgements, taking into account different factors and using the evidence that they have available to them. This evidence should include any documentary evidence from the benchmarking of the system prior to the maintenance activities, as well as after maintenance has taken place. This could be supported by a report, information sheet or presentation (videoed or 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](http://www.comptia.org)

[www.cisco.com/UK](http://www.cisco.com/UK)



**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	P4, M2, M3, D2
Problem solving/decision making	P4, P5, P6, P7, M3, D2
Time management	P4, P5, P6, P7, P8
Critical thinking	P4, M2, P6, P7, P8, 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 to support the school's or college's IT technicians, or with local computer businesses – the work experience should be structured so that learners can see in context all or some of the learning outcomes in this unit.
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.	Centres could arrange for local IT technicians to deliver a session to learners that would provide an insight into an IT technician's role when: <ul style="list-style-type: none"> <li>a) discussing with a client their individual requirements for a computer system</li> <li>b) formulating considerations particularly when selecting and installing software components (unit 19)</li> <li>c) implementing maintenance activities for large and small computer systems.</li> </ul>

To find out more

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

Alternatively, you can email us on **[vocational.qualifications@ocr.org.uk](mailto:vocational.qualifications@ocr.org.uk)**



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