Cambridge TECHNICALS

OCR LEVEL 2 CAMBRIDGE TECHNICAL

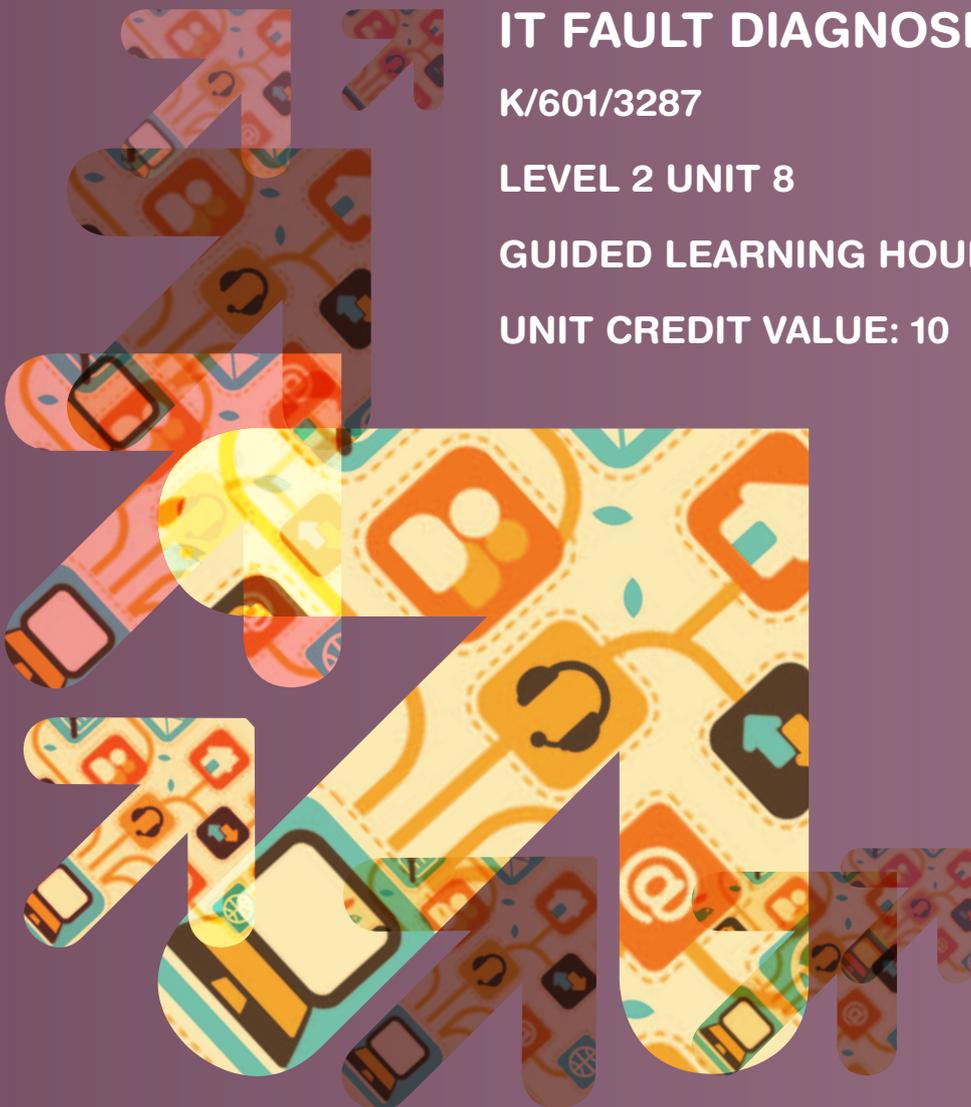## CERTIFICATE/DIPLOMA IN

IT

IT FAULT DIAGNOSIS AND REMEDY

/601/3287

EVEL 2 UNIT 8

GUIDED LEARNING HOURS: 60

UNIT CREDIT VALUE: 10

OCR

IT FAULT DIAGNOSIS AND REMEDY

K/601/3287

LEVEL 2

AIM OF THE UNIT

Software and Hardware can develop faults during installation and while in use. It is important the learner is able to carry out a logical investigation of a fault, questioning users where necessary using language appropriate for the knowledge level of the user. Having identified the fault, it is important the learner uses the necessary tools and techniques in a safe manner to repair the fault, meeting any service level agreements such as response times.

Fault diagnosis is an important skill for all IT Practitioners. Some learners will have probably undertaken some fault finding with their own machines but this would be unsystematic with no records kept and it will be necessary to cure learners of bad habits as well as teach them the correct approach.

By the end of the unit the learner should understand the need for fault diagnosis procedures and the recording of faults and their remedies in building a data base of experience which can be used to resolve issues more quickly and appropriately in the future.

ASSESSMENT AND GRADING CRITERIA

Learning Outcome (LO) The learner will:	Pass The assessment criteria are the pass requirements for this unit. The learner can:	Merit To achieve a merit the evidence must show that, in addition to the pass criteria, the learner is able to:	Distinction To achieve a distinction the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
1 Understand the procedures used in the IT diagnostics process	P1 describe the process of diagnosing faults		
	P2 describe organisational issues associated with fault diagnosis	M1 explain how organisations manage fault diagnosis to limit disruption	
2 Be able to identify the cause of common faults	P3 use diagnostic tools to identify common faults	M2 explain to a client any issues which might arise during diagnostic testing	
3 Be able to apply suitable remedies to identified faults	P4 apply identified fault remedies and check they work	M3 use different methods to protect data from loss or damage when applying fault remedies following organisational procedures	D1 evaluate the selection and application of fault remedies
	P5 produce a record of diagnostic information		

TEACHING CONTENT

The unit content describes what has to be taught to ensure that learners are able to access the highest grade.

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

LO1 Understand the procedures used in the IT diagnostics process:

- limits of responsibility for tackling faults (e.g. not allowed to attempt resolution of equipment under service agreement).
- **common faults:**
  o computer fails to boot up.
  o no sound
  o no screen images
  o unable to access files
  o unable to access printer
  o no power to the computer
  o unable to link to a network/the internet
  o unable to use particular programs or some of their facilities.
  o viruses or worms
  o hard disk failures
  o RAM problems
  o graphic card failures
  o system going very slow.
- **fault diagnosis basic approach:**
  o back up any data on system if appropriate
  o make a "best guess" of what may be wrong
  o replication of fault
  o narrow the search by trying a range of simple solutions
  o fault diagnosis support materials (e.g. manuals or text books)
  o any knowledge base or database of previous faults (e.g. logged faults and outcomes or more experienced individuals)
  o try range of possible solutions, one at a time.
- **additional fault diagnosis techniques available to organisations:**
  o interrogation of fault diagnosis database containing previous logged faults and associated solutions

  o diagnostic tests (e.g. organisation, manufacturer)
  o manufacturer support forums
- **record fault diagnosis data:**
  o issue and date of receipt
  o details of fault
  o solution or solutions attempted
  o tests conducted and results
  o successful outcome
  o date of solution
  o if unresolved date of escalation to expert.
- **store fault diagnosis data:**
  o IT Support database
  o manual recording on specified forms
  o fault log book.

Organisational concerns:

- **down time of:**
  o individual work station
  o LAN
  o WAN
  o inability to run important programs: (e.g. Payroll, Payments Invoices, Computer controlled processes, Robotic workshops, Safety facilities, Security facilities).
- **loss business:**
  o existing customers
  o potential customers.
- cost implication of repair or replacement
- **mitigating disruption:**
  o backup systems (e.g. regular backup of data and system, parallel systems, multiple backups at multiple locations, relocating staff, providing temporary equipment).

LO2 Be able to identify causes of common faults:

- **computer systems diagnostic tools:**
  - o manufacturer support and download sites
  - o systems diagnostic software
  - o ammeters and voltmeters for power issues **NB – learners should not be taught to open power supplied hardware or monitors**
- **customer communication:**
  - o plain English, no jargon
  - o communication approach (e.g. to suit the Level of knowledge adapting terminology to suit, format of communications)
  - o identification of possible problems for user (e.g. Removal of computer to testing/repair location, Loss of access to some/all facilities, Loss of data not already backed up).
- **diagnose faults:**
  - o follow procedures (e.g. response time for contacting customer, recording of fault and diagnosis, closing fault)
  - o user appropriate tools, systems or manufacturer diagnostic software, meters for power and electricity related issue
  - o complete required document.

LO3 Be able to apply suitable remedies for identified faults:

- **understand:**
  - o limits of responsibility in carrying out remedial work (e.g. not allowed to carry out work on computers or software subject to service agreements)
  - o how to provide written or spoken guidance to colleagues or customer, if they have to provide input to the process
  - o the importance of trying the easiest and cheapest remedies first so as not to waste resources
- **application of fault remedies:**
  - o simplest, (e.g. reinstall software, exchange a component for a used one known to be working)
  - o easiest (e.g. check computer is plugged in to socket and socket is live before changing power pack)
  - o more complex (e.g. mother board replacement or new disc drive)

- o point of escalation to expert
- o testing (e.g. information outcomes, display criteria, outcomes of data manipulation)
- o compare testing to functioning systems.
- **record fault remedy outcomes and test results on:**
  - o IT Support database;
  - o manual recording on specified forms;
  - o fault log book.
- **review the choice of fault remedies identified and used:**
  - o where procedures followed (e.g. within limits of responsibility)
  - o time taken from logging of fault to resolution
  - o cost, time, money, other resources, reputation
  - o existing remedies worked, failed, reasons for non-use
  - o new approaches identified and used, superior or inferior to existing remedies, no remedies previously available, etc
  - o conclusions and recommendations for the future
  - o identify personal training requirements to improve skills and knowledge with respect to IT systems fault diagnosis and repair.
- **diagnostic information:**
  - o work content e.g.
    - • date
    - • name of person
    - • location of device
    - • location of fault
    - • error code
    - • symptom
    - • details of problem
    - • any parts used
    - • action taken
    - • problem history
  - o log
  - o diary
  - o pre-printed form
  - o paper-based or electronic.

DELIVERY GUIDANCE

Learners will need to practice fault diagnoses and remedies as well as understand what they are and how to use them effectively in the work place. If learners have experience either in the work place or while on work placement, then they should be encouraged to offer such experience towards the assessment of this unit. They could also be invited to share their experiences with novice colleagues during class to confirm that what is being required of them will aid their development in to useful IT Practitioners. Encourage learners to review the faults that they have encountered when working with or using computers. Discuss how they dealt with these, how they discovered just what the fault was and how to repair it. Learners should carry out a minimum of ten fault finding activities ranging from the simple to the complex to ensure they have a full understanding of the process and the scope.

Understand the procedures used in the IT diagnostics process

Students can research different approaches to fault diagnosis, routines to be followed from recording the fault, working from simple to more complex faults and tests in order to identify the issues. Group discussions will identify different approaches and requirements for different fault types. Learners should also investigate the issues which affect organisations when systems develop faults such as; prioritising jobs to reduce or avoid loss of data, loss of processing capability, loss of communications for example.

All of these activities can be undertaken in small groups which then feedback to the larger group where the findings can be recorded and discussed in order to identify good practice and common themes.

A range of faults should be diagnosed, e.g. hardware, software, peripherals. Common faults include slow running computers, viruses, spyware or adware, computer stops responding (computer crash). It is important for the learners to appreciate the need for a logical and step by step diagnosis of the fault discussing the approaches and identifying simple criteria before extending to more advanced and knowing that when a computer will not turn on it is logical to check that the computer is plugged in and the socket is live before replacing the motherboard.

The precise nature the fault finding routine will depend upon the type of fault. The learners should be encouraged to explore the ways in which companies deal with fault diagnoses, e.g. help desks or technical support units, email, voice or on or line systems for registering faults to minimise disruption and ensure that the company's policies and procedures are met in terms of response times and meeting health and safety standards. This can be done through discussions with help desks or technical support teams within the centre or work place as many organisations have their own help-desk or technical support department who maintain lists of faults and the routines which should be followed in order to identify the precise nature of the fault.

Be able to identify the cause of common faults

The learners will need to have the opportunity to undertake fault diagnosis activities; these may be created for the learners by using stand alone machines or networks which are used specifically for training purposes: in these cases the learner will need to know who their customer is. It may also be possible to provide a "Help Desk" facility for the training laboratories where each learner can spend time diagnosing and remedying faults and communicating with customers. The learners need to recognise the range of more common faults which have been identified in the teaching content and how to repair them. They should share this information with other members of their "support team" which could be the entire group or smaller groups.

The learner will need to use a range of diagnostic tools, such as troubleshooting software routines, power supply testers, voltmeters, ammeters, ohmmeters. Learners should discuss the ways in which a fault manifests itself and should be taught to identify activities that may occur while diagnostic testing takes place such as the system running slowly, the need to remove the machine to the workshop or taking over the machine remotely, test plans for isolating faults. There is a need to identify the relevant health and safety rules for carrying out diagnostics this many include manual lifting (computers and peripherals can be heavy), insulated mats and tools, anti-static wristbands, the groups as good practice should be able to identify these and should discuss the details of processes that an organisation may have. The learner should discuss appropriate methods of communicating with the user to identify any issues and why different methods are appropriate for users and faults e.g. telephone call where email is not working, or a user needs to be talked through changes.

Be able to apply suitable remedies to identified faults

The use of help desks and technical support specialists, service level agreement, methods of capturing and recording faults, diagnoses and remedies can be identified in a similar way. If there are learners present with experience of any of these areas then they should be encouraged to share their experiences with the group. The remedies should normally appear alongside the diagnosis, such as the user has a blank computer screen but power is entering the system: reseat the graphics card, if that does not work, reseat the CPU, checking that the RAM is properly seated and so on.

Learners should be provided with a "check list" of remedies for specific faults with which to work or they could create such a check list during class discussions and activities, while covering the theory of diagnosis and remedy of faults. The learners must also use a range of methods to protect data from loss or damage while applying fault remedies and these should be practised in small groups and should include using system and data back up procedures. As the learners are engaged in potentially hazardous activities such as heavy lifting or working with electrical systems, they must comply with organisational health and safety techniques and procedures and discuss what they think these are why they are important and any breaches they may have experienced.

It is important to record the nature of the fault and the steps taken to identify a remedy and implement it. The group should create a central log to record these and this would give them a simple database of faults and remedies. They could then be given similar faults to address and should be able to do this using the records they have maintained. This will also encourage them to develop this as good practice moving forwards to ensure the rapid resolution of similar faults in the future, to identify new faults and improved remedies, to record the steps taken so that others can use this as a basis taking into account any relevant prior history of systems when diagnosing the fault. Categories of fault may include hardware components, software bugs and versioning, permissions/access and user issues.

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

Assessment Criteria P1, P2, M1

For P1, the learner should describe the process of diagnosing faults. The evidence for this could be in the format of a guide that could help new people to the organisation, a presentation (to include speaker notes or a video of the learner delivering the presentation), an audio recording of the learner describing the process or written reports. The learner should provide a description for diagnosing a range (at least three) different types of faults.

For P2, the learner should describe organisational issues associated with fault diagnosis. The learners must consider the bullet lists in the teaching content under organisational concerns. It is suggested that the learners consider a range (three or more) different types of fault diagnosis and the implications that these types of faults can have on an organisation. They should be considering the impact on the organisation whilst fault diagnosis is being carried out, as well as the impact with respect to repair or replace etc.

For the merit criterion M1 the learner must explain how organisations manage fault diagnosis to limit disruption. The evidence could be in the form of a presentation (either with speaker notes or a video of the learner giving the presentation), an audio recording of the learner explaining to the teacher, a report or recommendation to a business.

Assessment Criteria P3, P4, P5, M2, M3, D1

For P3, the learners must provide evidence of using diagnostic tools to identify common faults. Learners should use a range (three or more) of different diagnostic tools to identify a range (three or more) of different common faults.

For merit criterion M2, learners must explain to a client, a range (three or more) of issues which might arise during diagnostic testing such as down time or a slow running system. The evidence could take the form of an audio or audio/visual recording of the discussions or a detailed observation or witness testimony which clearly supports and articulates the learner's explanations. Additional written explanations may also support this.

For P4, learners must apply identified fault remedies and check they work. This could be an extension to the faults they diagnosed in P3. The evidence must include the learner

identifying the remedy, applying the remedy and the checking that the fault has been addressed. The evidence could be in the form of a video with the learner talking through the process, a detailed observation from the teacher, identifying the fault, the chosen remedy and how it was tested. It could also be presented in the form of a report. There must be clear evidence of testing which could include the completion of a test plan.

For merit criterion M3, the learners must use different methods to protect data from loss or damage when applying fault remedies following organisational procedures. This could be an extension to P4. The learners could provide evidence by providing copies of screen shots, personal statements and/or witness testimonies from customers and/or tutor These could also include completed log sheets or audio/visual records. They should also identify any organisational requirements or procedures they may be required to follow.

For distinction criterion D1, the learners must evaluate the selection and application of fault remedies. The learners could create a table where they detail the fault remedies they identified and selected in P4 and evaluate the effectiveness of it and why they selected that particular solution. The learners could provide an audio or video recording of them presenting their evaluation or they could present their evaluation in the form of a report.

For P5, the learners must produce a record of diagnostic information. This could be an extension of P3 and P4. The diagnostic information must include relevant bullet points from the teaching content under diagnostic information. The evidence will be a copy or printout of the diagnostic information.

Scenarios:

P1/P2/M1 – These assessment criteria could be carried out through a research project where learners are asked to produce a guide for new support staff on fault diagnosis and remedy in an organisation, the organisation can be one with which they are familiar, a fictional company for which they are given the fault diagnosis and remedy policies and procedures, or a real work environment. The guide must include brief descriptions of different faults which can occur with IT systems, why it is important that the organisation has a process to manage the reporting, identification and remedial actions to resolve

the faults, the organisation's own processes in ensuring that disruption is minimised.

Learners could carry out research on diagnostic methods and tools for diagnosing faults. They could consider the impact such faults would have on an organisation and how this disruption could be minimised. They could identify suitable remedies for the faults and identify the methods they would need to use to prevent data loss or damage.

Learners could be given systems to work on which have a range of faults which they have to diagnose and repair. They could complete diagnostic records of the diagnosis work they have carried out.

MAPPING WITHIN THE QUALIFICATION TO THE OTHER UNITS

Unit 4: Installing Computer Hardware

Unit 5: Installing Computer Software

Unit 6: Setting up an IT Network

LINKS TO NOS

5.5 IT/technology systems installation, implementation and handover,

6.3 IT disaster recovery plan,

7.2 IT/Technology Service Help Desk and Incident Management,

7.5 IT/Technology management and support,

7.9 IT/Technology Service Catalogue and/or Service Level Management Measurement and Reporting

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