Unit 8: IT Fault Diagnosis and Remedy

Unit code: K/601/3287

QCF Level 2: BTEC Specialist

Credit value: 10

Guided learning hours: 60

Aim and purpose

The aim of this unit is to give learners an understanding of IT diagnostic procedures and equip them with skills required to identify and repair common faults.

Unit introduction

Many everyday activities in the modern world use or are influenced by computers and it is important that technical faults within such systems are diagnosed and rectified quickly as the impact of faults can have severe effects on companies and individuals.

This unit is designed to help learners diagnose common faults in IT equipment by the applying application of diagnostic tools, gathering and recording relevant information and the analysis of this information to identify the cause of common faults. The unit also deals with appropriate remedies for some common technical faults.

Learners are asked to demonstrate their knowledge of the investigation process and their ability to use some common diagnostic tools, applying suitable investigation and diagnostic techniques that are suitable for the particular system under investigation.

Health and safety issues must be considered every time learners are involved with electronic items and it is expected that all learners will work safely and have a thorough understanding of the associated health and safety issues involved.

Learning outcomes and assessment 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 determine the standard required to achieve the unit.

On completion of this unit a learner should:

Learning outcomes	Assessment criteria
1 Understand the procedures used in the IT diagnostics process	1.1 describe the process of diagnosing faults 1.2 describe organisational issues associated with fault diagnosis
2 Be able to identify the cause of common faults	2.1 use diagnostic tools to identify common faults
3 Be able to apply suitable remedies to identified faults	3.1 apply identified fault remedies and check they work 3.2 produce a record of diagnostic information

Unit content

1 Understand the procedures used in the IT diagnostics process

Procedures: fault validation, information gathering, information analysis, solution identification

Diagnostic process: information sources eg automatic error messages, helpdesk records, questioning the user, technical manuals; specific fault identification procedures eg using flowcharts; fault validation; minimise disruption; escalation; communicating with user eg estimate time for repair, estimate cost

Organisational issues: fault rectification policy eg problem description, problem history, problem location, technical information on the system under investigation, any parts used, actions taken and their outcome, time and expense records; business impact eg loss of service, customer dissatisfaction, errors in information; other considerations eg repair cost vs replacement, resource availability, skill availability, ease of repair

2 Be able to identify the cause of common faults

Types of fault: hardware eg component failure, communication problem, peripheral; software eg inappropriate printer driver, out-of-date version, virus, software bug; user related issues; compatibility issues

Diagnostic tools: physical devices eg multi-meter; software applications eg PC Tools; operating system tools eg MS Windows Device Manager; others eg power on self-tests

3 Be able to apply suitable remedies to identified faults

Fault remedies: identification of suitable remedy eg repair, refer problem, replace component, upgrade software, work-around

Diagnostic information: record of work content eg date, name of person, location of fault, location of device, error code, parts used, problem detail, symptom, action taken, problem history; record of work eg log, diary, pre-printed form

Essential guidance for tutors

Delivery

At Level 2, learners are asked to deal with routine faults that may be intermittent but do have an impact on a service or customer.

It is likely that learners will have a natural curiosity and possibly a competitive drive to identify faults and this may well provide motivation. It is also likely that they may not have sufficiently formal or rigorous problemsolving skills that will allow reliable diagnosis. In respect of a delivery strategy, this can be addressed using such tools as checklists and flowcharts together with an insistence on documentation and following a procedure.

It is advised that a series of development activities are generated that simulate typical faults that are realistic but limited and solvable and this will build confidence. Formative feedback offered should include the process of diagnosis and the completion of logbooks etc, not just on the accuracy of the diagnosis.

Wall displays showing flowcharts that are used to identify faults will help confirm the process and any final 'NO' that puts the diagnosis out of learners' scope should direct them to escalate the issue.

Work shadowing would provide excellent opportunities to broaden out experience in a controlled way and access to real work logs are invaluable ways of providing the complexity needed to develop analysis skills.

As well as contact with technicians, insights can be gained through visits or talks with managers who make decisions or purchases. As well as record keeping and a methodical approach, effective technicians also need to develop effective techniques in observation and concentration. These tend to develop an ordered and calm environment and the production of a set of workshop rules is advised.

In terms of the sequence of delivery, reflecting the ordering of the unit content would be appropriate. However, introducing a range of progressive but limited workshop activities could be explored to maintain interest. Essential theory and understanding can be built into preparation or conclusion of individual activities and significant amounts of self directed learning can take place. Tasks could be based around a series of questions that require research or other learning as well as simple checks to confirm that a logical approach was taken.

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 in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction to the unit
Fault finding procedures: • whole-class exercise – tutor presentation on gathering information, followed by individual exercise • whole-class exercise – tutor presentation on the diagnostic process, followed by individual exercise • guided research – learners look at types of fault and diagnostic tools • whole-class exercise – tutor-led discussion plus support desk talk; developing checklists.
Assignment 1 - How to Diagnose Computer Faults
Organisational issues: • whole-class exercise – tutor presentation on policies, followed by individual exercise • whole-class exercise – tutor presentation on business impact, followed by individual exercise • whole-class exercise – tutor-led research into other organisational issues. **Visiting speaker.** **Other issues.**
Assessment 2 - Faults and the Organisation
Applying remedies: • individual exercise – learners identify remedies for scenarios given by the tutor • individual exercise – learners make appropriate records of their fault-diagnosis process • individual exercise – work shadowing.
Assessment 3 - Solving the Problems

Assessment

It is suggested that this unit is assessed using three assignments as summarised in the *Programme of suggested assignments* table.

This unit tends to allow for a wide range of types of evidence to be used. Observation records, logbooks and completed checklists are examples of evidence that are naturally occurring and are to be encouraged. In other situations, written materials may be appropriate but ideally they should be considered in a realistic context such as in support of presentation and demonstration to peers about how a particular tool works or a leaflet designed to inform new technicians.

To achieve a pass grade, learners must achieve all the pass criteria listed in the grading grid.

The suggested scenario is that the learner is training to work on an IT helpdesk. It is suggested that the evidence for these criteria is produced in the format of an information leaflet but any other appropriate format may be used.

For 1.1, learners are to describe the process of diagnosing faults. The content for this can be drawn from the unit content under the headings 'procedures' and 'diagnostic process'. Learners should attempt to include at least three of the main procedures.

Following on from the first assignment, learners now considers faults from an organisational view point. Learners will need to be given a case study or collect information about a real organisation. This could be evidenced using a presentation.

For 1.2, at least three issues should be identified and described.

To gather evidence for this assignment, learners must act as a helpdesk support technician and deal with user computer problems. The tutor will probably have to deliberately set up faults ready for diagnosis.

For 2.1, a table could be used identifying faults and the tools used to diagnose them, eg a checklist of questions.

For 3.1, the evidence could be in the form of a table indicating the fault, the remedy and how the system was checked.

For 3.2, logbook evidence or observation records are appropriate, however, there must be some evidence from an tutor that the faults were correctly identified, for example an observational record signed by an tutor that confirmed that the remedy was successful. Alternatively, other sources of evidence are acceptable including written reports and screenshots.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the assessment 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 Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
1.1	How to Diagnose Computer Faults	You are training to work on an IT helpdesk and have been asked to prepare a leaflet describing the diagnostic process and the issues surrounding it.	Information leaflet.
1.2	Faults and the Organisation	You are to give a presentation outlining organisational issues related to computer faults.	Presentation.
2.1, 3.1, 3.2	Solving the Problems	You are to work on a helpdesk and diagnose, correct and record faults.	Records/logs of activities. Witness statement. Observation record.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC in IT sector suite. This unit has particular links with:

Level 1	Level 2	Level 3
	IT Support	IT Technical Support

This unit maps to some of the underpinning knowledge from the following areas of competence in the Level 2 National Occupational Standards for IT (ProCom):

7.3 IT/Technology Problem Management

7.4 IT Application Management/ Support

7.5 IT/Technology Management and Support.

Essential resources

Learners will need access to appropriate hardware and software resources based in a specialist computing workshop. Specific equipment will vary based upon the actual activities undertaken.

Employer engagement and vocational contexts

The use of vocational context is essential in the delivery and assessment of this unit. Learners will require access to computer equipment to enable them to gain a practical awareness and enable them to apply their knowledge and understanding in a practical situation.

There is a range of organisations that may be able help centres to engage and involve local employers in the delivery of this unit, for example:

- Learning and Skills Network – www.vocationallearning.org.uk
- Local, regional business links – www.businesslink.gov.uk
- National Education and Business Partnership Network – www.nebpn.org
- Network for Science, Technology, Engineering and Maths Network Ambassadors Scheme – www.stemnet.org.uk
- Work-based learning guidance – www.aimhighersw.ac.uk/wbl.htm
- Work experience/workplace learning frameworks – Centre for Education and Industry (CEI University of Warwick) – www.warwick.ac.uk/wie/cei

Indicative reading for learners

Textbooks

British Computing Society 2004 – *The BCS Glossary of IT and Computing Terms* (British Computer Society, 2008) ISBN 1906124000 (updated regularly)

Dick D – *The PC Support Handbook* (Dumbreck Publishing, 2000) ISBN 0952148471

Websites

A wide variety of resources is available on the internet – care should be exercised, however, in selecting particular sites and those recommended for use by learners should be checked first.

www.pcguide.com

www.pcworld.com

www.tomshardware.com

Functional Skills – Level 2

Skill	When learners are …
ICT - Using ICT	
Plan solutions to complex tasks by analysing the necessary stages	describing the process of diagnosing faults using
select, interact with and use ICT systems safely and securely for a complex task in non-routine and unfamiliar contexts	diagnostic tools to identify common faults.