Unit 401 Maintain Equipment and Systems Level 2 (Core)

Rationale
This unit will enable the candidate to undertake routine preventative maintenance, and to identify problems with, and apply remedial maintenance to ICT hardware/equipment in stand alone and peer-to-peer systems.

There are 5 outcomes to this unit. The candidate will be able to:
1. identify hazards and reduce risks to health and safety
2. identify hazards and reduce risks associated with electrostatic discharge
3. apply, check and record preventative maintenance procedures on hardware/equipment in ICT systems
4. identify failures with hardware/equipment in ICT systems
5. apply, check and record remedial maintenance on hardware/equipment in ICT systems.

Guided learning hours
The recommended guided learning hours for this unit are 60 hours.

Connections with other awards
NVQ links

Outcomes	This award contributes to the knowledge and understanding of the following elements of NVQ(s)
	C&G 4300 Installing and Supporting IT Systems Level 2
1 & 2	206.1 Identify the hazards and evaluate the risks in your workplace
1 & 2	206.2 Reduce the risks to health and safety in your workplace
3, 4, 5	211.1 Maintain system equipment
5	211.2 Maintain media and documentation libraries
	C&G 4348 IT Services (Customer Systems Support) Level 2
3	11.1 Prepare to apply preventative maintenance procedures for IT systems
3	11.2 Apply preventative maintenance procedures for IT systems
4	12.1 Identify solutions for failures in hardware
5	12.2 Prepare to apply remedial solutions for hardware
5	12.3 Apply remedial solutions to hardware
4	13.1 Identify solutions for failures in software components
5	13.2 Prepare to apply remedial solutions for software components
5	13.3 Apply remedial solutions to software components
1, 2	101.1 Identify the hazards and evaluate the risks in your workplace
1, 2	101.2 Reduce the risks to health and safety in your workplace

Key Skills links

Communication	C2.2 C2.3
Application of number	
IT	IT 2.1
Working with others	
Improving own learning	LP 2
Problem solving	PS 2

Assessment
Assessment will be by means of a **set assignment** covering practical activities, and a **multiple choice test** covering underpinning knowledge.

Outcome 1: Identify hazards and reduce risks to health and safety

	Candidate's signature	**Date**
Practical activities **The candidate will be able to:** 1. identify location and content of relevant health and safety procedures 2. identify the person(s) responsible for managing health and safety 3. evaluate and deal with common hazards and risks, e.g. • trailing cables • noise levels • electric shock hazards 4. set up an ICT system to comply with regulations, e.g. • health and safety • environmental 5. demonstrate safe manual handling techniques for lifting ICT equipment and hardware 6. check and correct wiring of plugs and fuse ratings for a range of appliances, e.g. • monitor • base unit • printer • scanner.		

Underpinning knowledge
The candidate will be able to:

1. identify the four main responsibilities of employees under the Health and Safety at Work Act 1974, i.e.
   - work safely
   - co-operate with employer in safety systems
   - report any hazardous conditions
   - do not interfere with safety systems

2. identify the main responsibilities of employees under the Control of Substances Hazardous to Health Regulations (COSHH)

3. state the health and safety responsibilities of employees including peripatetic workers in relation to:
   - fire procedures and evacuation
   - accident reporting procedures
   - special safety features of the site
   - actions to be taken in an emergency

4. state the definitions of a hazard and a risk

5. identify common hazards and risks associated with:
   - use and maintenance of machinery and equipment
   - clothing, jewellery
   - use of materials or substances
   - working practices that do not conform to health and safety procedures
   - unsafe behaviour
   - accidental breakage and spillage
   - environmental factors
   - hazardous voltages

6. state the importance of dealing with and/or promptly reporting hazards

7. state the principles of safe manual handling for lifting/moving PCs, monitors, printers, cabinets, etc.

8. calculate fuse ratings, (including safety factors for surge etc.) for common items, e.g.
   - monitor
   - base unit
   - printer
   - scanner

9. state the importance of portable appliance testing (PAT)

10. state actions to be taken where appliance testing label is out of date or missing (i.e. report)

11. identify correct fire extinguishers for use on different types of fire, e.g.
    - powder – most classes of fire, including electrical
    - water – class A (wood, paper, textiles)
    - Aqueous Film Forming Foam (AFFF) – classes A and B (solids and flammable liquids)
    - CO_2 – class B and live electrical
    - chemical foam – solids, flammables, liquids.

Outcome 2: Identify hazards and reduce risks associated with electrostatic discharge

	Candidate's signature	**Date**
Practical activities **The candidate will be able to:** 1. use common anti-static devices 2. test anti-static devices to ensure that they are functioning correctly and record results 3. pack and unpack a static sensitive device, e.g. • printed circuit board (PCB) • disk drive (CD, DVD, diskette) • RAM • CPU.		
Underpinning knowledge **The candidate will be able to:** 1. explain what is meant by static electricity and electro-static discharge 2. outline the basic principles of electrostatics, i.e. charge, static charge generation 3. state the implications of equipment damaged by electro-static discharge, e.g. may introduce other seemingly unrelated faults to equipment, time and money, cumulative effects 4. describe the methods used to control electro-static discharge in the working environment, e.g. charge prevention, grounding, shielding, neutralisation, education 5. list commonly used anti-static devices, e.g. wrist strap, bench mat, floor mat, coat, shoes 6. state the importance of periodic testing of anti-static protection devices.		

Outcome 3: Apply, check and record preventative maintenance procedures on hardware/equipment in ICT systems

	Candidate's signature	**Date**
Practical activities **The candidate will be able to:** 1. carry out preventative maintenance using the procedures, materials and parts recommended 2. test the equipment to check that the preventative maintenance procedures have been carried out successfully 3. report any problems encountered 4. maintain preventative maintenance records.		

Underpinning knowledge
The candidate will be able to:

1. state the need for preventative maintenance

2. identify where preventative maintenance procedures may be kept, e.g. with customer, with equipment, customer response centre

3. state why preventative maintenance procedures have to be co-ordinated with the user

4. identify indicators or records that would show that preventative maintenance was needed, e.g. system initiated call, following replacement of a component part, locally kept records, periodic

5. state how to identify the materials, equipment and time required to carry out preventative maintenance, e.g. availability of materials, manufacturers' service manuals, locally produced service manuals, referral to supervisors or experienced personnel, user – regarding accessibility of equipment

6. state problems which may arise and who should be informed, e.g. faulty parts, unexpected unavailability of equipment from user

7. state the requirements for safe disposal of hazardous waste to comply with the current legislation, (e.g. environmental protection, recycling)

8. identify post maintenance procedures, e.g. power on self test and other diagnostic routines, system test, report any failures, return materials as appropriate

9. describe common systems for recording the implementation of preventative maintenance procedures, e.g. locally kept records, maintenance manual, logs in the equipment itself, site log.

Outcome 4: Identify failures with hardware/equipment in ICT systems

	Candidate's signature	**Date**
Practical activities **The candidate will be able to:** 1. gather accurate and relevant information on failures, e.g. • base unit • keyboard • mouse • printer • monitor • scanner 2. diagnose causes of failures, e.g. hardware, software • video board • fuse in base unit • ball in mouse • CMOS battery • monitor settings • disk drives (CD, DVD, diskette) • hard drive • printer driver • NIC • cables 3. use diagnostic tools to include operating system tools, third party hardware and software diagnostics, equipment self test facilities 4. identify and confirm remedial actions to be taken.		

Underpinning knowledge
The candidate will be able to:

1. identify sources of information available to assist with the analysis of a failure, e.g. error messages, failure log, site documentation, software log, typical diagnostic utilities, referral to others
2. identify possible remedial actions, e.g. fix, replace, upgrade
3. state the reasons for analysing information
4. state procedures for reporting remedial actions taken.

Outcome 5: Apply, check and record remedial maintenance on hardware/equipment in ICT systems

	Candidate's signature	**Date**
Practical activities **The candidate will be able to:** 1. obtain resources to remedy the failure, e.g. • manufacturers' instructions • spare parts • access to the equipment/system • time resources 2. carry out remedial maintenance using the procedures, materials and parts recommended 3. check that the remedial maintenance has been carried out successfully 4. report any problems in the performance of the system 5. maintain remedial maintenance records.		

Underpinning knowledge
The candidate will be able to:

1. identify where to access information on how to carry out remedial maintenance, e.g. websites, manufacturers' service manuals, locally produced service manuals, referral to immediate supervisors or experienced personnel

2. identify types of resources required for remedial maintenance, e.g. procedures, availability of parts, time, materials, expertise, support

3. state how to verify that the materials, equipment and time required are available to carry out the remedial maintenance, e.g. confirmation with procedure and or parts lists in the service manual, referral to locally produced service manual, own knowledge of this or similar problem, confirmation by supervisor or experienced colleague, referral to the user

4. state how to check that remedial maintenance has been effective, e.g. test procedure/diagnostic routine

5. state problems which may arise and who should be informed of them, e.g. faulty service parts, unexpected unavailability of equipment from user, failure of tests, fault has changed

6. describe common systems for recording the implementation of remedial maintenance, e.g. locally kept records, maintenance manual, logs in the equipment itself, remotely held records

7. explain why it is important to record remedial maintenance, e.g. records can be referred to during any other remedial maintenance, removes duplication of effort when fault-finding problems, records parts used, can be accessed by the user to ascertain if contract/maintenance of equipment is being carried out, for service level commitments.