LJ Technical Systems

DIGIAC
A+ Certification Training System
Instructor's Management Guide

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Written by: LJ Technical Dept

About this Instructor's Guide

This *Instructor's Management Guide* contains information on setting up and running a Digiac A+ Certification Training System. It contains an introduction to the A+ program, guidance on structuring the course, and how the individual modules should be used.

This guide should be used in conjunction with the Instructor's Guide supplied with the individual modules, which will contain specific instructions for installing and using the module.

Information on setting up and running the Class*Act* computer managed learning system is contained in the Class*Act* Laboratory Management Instructor's Guide ST520, supplied with the Class*Act* software. This contains tutorials on the facilities available in the Class*Act* system and should be referred to for information on using Class*Act* in the A+ Pod.

Contents

The A+ Certification Program

An Introduction

The A+ Certification is an industry-recognized credential that certifies the competency of PC service technicians. The Computing Technology Industry Association (CompTIA) sponsors the exam and over 50 major computer hardware and software manufacturers, vendors, distributors, resellers and publishers, back the program. A+ Certification provides a wealth of benefits to any person seeking a job in the computer industry with many computer companies making A+ Certification a requirement of employment.

To obtain the A+ Certification the student must pass two exams – the A+ Core exam and the DOS/Windows exam. No requirements are required to take the exam other than payment of an examination fee.

More information on the A+ Examination can be found on the CompTIA website *http://www.comptia.org*

The A+ Pod has been developed to meet the requirements of the A+ Examination.

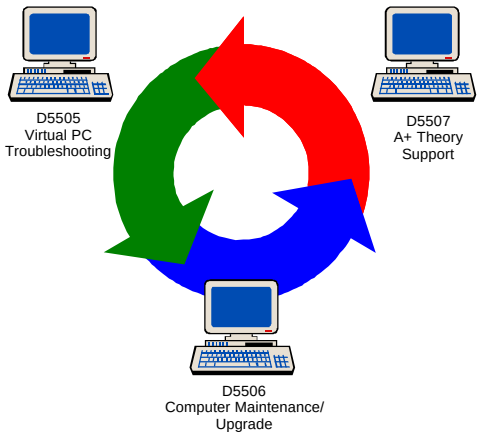
Using the A+ Pod in a Rotational Program

The Digiac A+ Certification Training System consists of the following modules:

D5505 Virtual PC Troubleshooting Module
D5506 Computer Maintenance/Upgrade Module
D5507 A+ Theory Support Module
D5508 A+ Exam Preparation Module

The Training System has been created so that three student groups (individuals or pairs) can rotate around three workstations, each containing either D5505, D5506 or D5507. This arrangement of three workstations is known as an A+ Pod. A student group will complete one 90 minute Assignment of a Module before rotating to the next workstation. These three modules each contain 20 assignments, giving a total time of 90 hours to complete the three modules.

- Students working at the D5505 workstation will rotate to the D5506 workstation.
- Students working at the D5506 workstation will rotate to the D5507 workstation.
- Students working at the D5507 workstation will rotate to the D5505 workstation.



After completing all of the work in these three modules, all student groups may then work on the D5508 A+ Preparation module, during which no rotation occurs.

Three Class*Act* Course Profiles for three student groups (A, B & C) are provided on the ClassAct Lesson Module Template disk provided with each module (SD3039).

A table showing the complete rotational sequence for the three student groups is shown on the following pages.

Rotation Step	Student Group A	Student Group B	Student Group C
1	D5505 Pre-Test Quiz Assignment 1	D5506 Pre-Test Quiz Assignment 1	D5507 Pre-Test Quiz Assignment 1
2	D5506 Pre-Test Quiz Assignment 1	D5507 Pre-Test Quiz Assignment 1	D5505 Pre-Test Quiz Assignment 1
3	D5507 Pre-Test Quiz Assignment 1	D5505 Pre-Test Quiz Assignment 1	D5506 Pre-Test Quiz Assignment 1
4	D5505 Assignment 2	D5506 Assignment 2	D5507 Assignment 2
5	D5506 Assignment 2	D5507 Assignment 2	D5505 Assignment 2
6	D5507 Assignment 2	D5505 Assignment 2	D5506 Assignment 2
7	D5505 Assignment 3	D5506 Assignment 3	D5507 Assignment 3
8	D5506 Assignment 3	D5507 Assignment 3	D5505 Assignment 3
9	D5507 Assignment 3	D5505 Assignment 3	D5506 Assignment 3
0	D5505 Assignment 4	D5506 Assignment 4	D5507 Assignment 4
11	D5506 Assignment 4	D5507 Assignment 4	D5505 Assignment 4
12	D5507 Assignment 4	D5505 Assignment 4	D5506 Assignment 4
13	D5505 Assignment 5	D5506 Assignment 5	D5507 Assignment 5
14	D5506 Assignment 5	D5507 Assignment 5	D5505 Assignment 5
15	D5507 Assignment 5	D5505 Assignment 5	D5506 Assignment 5
16	D5505 Assignment 6	D5506 Assignment 6	D5507 Assignment 6
17	D5506 Assignment 6	D5507 Assignment 6	D5505 Assignment 6
18	D5507 Assignment 6	D5505 Assignment 6	D5506 Assignment 6

Rotation Step	Student Group A	Student Group B	Student Group C
19	D5505 Assignment 7	D5506 Assignment 7	D5507 Assignment 7
20	D5506 Assignment 7	D5507 Assignment 7	D5505 Assignment 7
21	D5507 Assignment 7	D5505 Assignment 7	D5506 Assignment 7
22	D5505 Assignment 8	D5506 Assignment 8	D5507 Assignment 8
23	D5506 Assignment 8	D5507 Assignment 8	D5505 Assignment 8
24	D5507 Assignment 8	D5505 Assignment 8	D5506 Assignment 8
25	D5505 Assignment 9	D5506 Assignment 9	D5507 Assignment 9
26	D5506 Assignment 9	D5507 Assignment 9	D5505 Assignment 9
27	D5507 Assignment 9	D5505 Assignment 9	D5506 Assignment 9
28	D5505 Assignment 10	D5506 Assignment 10	D5507 Assignment 10
29	D5506 Assignment 10	D5507 Assignment 10	D5505 Assignment 10
30	D5507 Assignment 10	D5505 Assignment 10	D5506 Assignment 10
31	D5505 Assignment 11	D5506 Assignment 11	D5507 Assignment 11
32	D5506 Assignment 11	D5507 Assignment 11	D5505 Assignment 11
33	D5507 Assignment 11	D5505 Assignment 11	D5506 Assignment 11
34	D5505 Assignment 12	D5506 Assignment 12	D5507 Assignment 12
35	D5506 Assignment 12	D5507 Assignment 12	D5505 Assignment 12
36	D5507 Assignment 12	D5505 Assignment 12	D5506 Assignment 12
37	D5505 Assignment 13	D5506 Assignment 13	D5507 Assignment 13
38	D5506 Assignment 13	D5507 Assignment 13	D5505 Assignment 13
39	D5507 Assignment 13	D5505 Assignment 13	D5506 Assignment 13

Rotation Step	Student Group A	Student Group B	Student Group C
40	D5505 Assignment 14	D5506 Assignment 14	D5507 Assignment 14
41	D5506 Assignment 14	D5507 Assignment 14	D5505 Assignment 14
42	D5507 Assignment 14	D5505 Assignment 14	D5506 Assignment 14
43	D5505 Assignment 15	D5506 Assignment 15	D5507 Assignment 15
44	D5506 Assignment 15	D5507 Assignment 15	D5505 Assignment 15
45	D5507 Assignment 15	D5505 Assignment 15	D5506 Assignment 15
46	D5505 Assignment 16	D5506 Assignment 16	D5507 Assignment 16
47	D5506 Assignment 16	D5507 Assignment 16	D5505 Assignment 16
48	D5507 Assignment 16	D5505 Assignment 16	D5506 Assignment 16
49	D5505 Assignment 17	D5506 Assignment 17	D5507 Assignment 17
50	D5506 Assignment 17	D5507 Assignment 17	D5505 Assignment 17
51	D5507 Assignment 17	D5505 Assignment 17	D5506 Assignment 17
52	D5505 Assignment 18	D5506 Assignment 18	D5507 Assignment 18
53	D5506 Assignment 18	D5507 Assignment 18	D5505 Assignment 18
54	D5507 Assignment 18	D5505 Assignment 18	D5506 Assignment 18
55	D5505 Assignment 19	D5506 Assignment 19	D5507 Assignment 19
56	D5506 Assignment 19	D5507 Assignment 19	D5505 Assignment 19
57	D5507 Assignment 19	D5505 Assignment 19	D5506 Assignment 19
58	D5505 Assignment 20 Post Test	D5506 Assignment 20 Post Test	D5507 Assignment 20 Post Test
59	D5506 Assignment 20 Post Test	D5507 Assignment 20 Post Test	D5505 Assignment 20 Post Test
60	D5507 Assignment 20 Post Test	D5505 Assignment 20 Post Test	D5506 Assignment 20 Post Test

Student Group A	Student Group B	Student Group C
*D5508 Assignment 1	*D5508 Assignment 1	*D5508 Assignment 1
*D5508 Assignment 2	*D5508 Assignment 2	*D5508 Assignment 2
*D5508 Assignment 3	*D5508 Assignment 3	*D5508 Assignment 3
*D5508 Assignment 4	*D5508 Assignment 4	*D5508 Assignment 4

*No rotation occurs for the D5508 module.

D5505 'Virtual' PC Troubleshooting

This module uses the LJ developed 'Virtual' PC to give the student experience of troubleshooting a PC system.

In the module the student works through a series of on-screen simulation exercises, which present the student with problem scenarios ranging from missing program files to a damaged motherboard.

In each simulation, the student is presented, on-screen, with a modern Windows PC. They can switch it on and watch it start up. They can remove the case to look inside, and remove and replace the computer components.

On completing each troubleshooting exercise, the student is asked to complete a service report form, allowing them to build up a portfolio of problems and solutions.

Each 90-minute Assignment contains 2 simulation exercises, and relevant supporting theory sections provided in textbooks and on the computer, to build the required knowledge needed to complete the troubleshooting simulations.

The workstation will require a student workstation PC on which to run the on-screen assignments and answer the questions.

Assignment Content

1	**Theory**	Using the screens in this module
	Fault 1	Mouse is not detected Windows error message
2	**Theory**	The startup sequence of a computer
	Fault 2	System halts with timer POST error message
3	**Theory**	The hardware parts of a computer
	F**ault 3**	System appears to be dead
4	**Theory**	The CPU, Motherboard and Memory
	Fault 4	System fails serial port diagnostic test
5	**Theory**	Storage Devices
	Fault 5	System halts with floppy drive POST error message
6	**Fault 6**	Motherboard fault causes parallel port POST error
	Fault 7	System halts with keyboard POST error message
7	**Theory**	Input Devices
	Fault 8	Keyboard failed diagnostic test
8	**Fault 9**	System does not start up. Only power LEDs come on
	Fault 10	System halts with hard drive POST error
9	**Theory**	Windows Drivers and Resource Management
	Fault 11	CPU fault stops system starting up
10	**Theory**	Output Devices
	Fault 12	Sound device is not working

11	**Fault 13**	Monitor power lead is faulty
	Fault 14	Motherboard fault causes intermittent crash.
12	**Theory**	Software Applications
	Fault 15	Floppy drive data cable is faulty
13	**Theory**	Windows Troubleshooting Tools
	Fault 16	Database software needs reinstalling
14	**Fault 17**	Windows display limited to 16 color mode
	Fault 18	Windows software fault causes intermittent crashes
15	**Fault 19**	CD-ROM driver was not working properly
	Fault 20	Database application does not run
16	**Fault 21**	Video card is faulty
	Fault 22	Sound device has a resource conflict
17	**Fault 23**	CD-ROM drive power supply incorrect
	Fault 24	DIMM was faulty
18	**Fault 25**	USB port has a memory resources conflict
	Fault 26	Video card is faulty
19	**Fault 27**	DIMM and keyboard are both faulty
	Fault 28	CD-ROM drive is faulty
20	**Fault 29**	Sound device driver was not working properly
	Fault 30	PSU cannot power all devices.

D5506 Computer Maintenance/Upgrade

In the D5506 module students will use a real PC on which they will carry out computer maintenance and upgrading activities.

Assignments contain a mixture of theory and practical work.

In the theory section of an assignment students research questions using a computer based training CD-ROM package, or the textbook 'A+ Exam Prep'. The student is first presented with the question. A hint is available for each question giving an indication of where to look to research the answer.

In the practical section of an assignment students carry out a hands-on exercise using the D5506 computer. Practical activities include setting up an Electrostatic Discharge workstation, installing the Windows operating system, setting up the motherboard, using hard drive software tools, performing maintenance procedures, installing a modem, webcam, scanner, software application, printer, additional memory and hard drive. Students also examine the basic devices and connectors in the computer such as the power supply, keyboard, and floppy drive. Students explore the Windows operating system, and examine how to make changes to the computer setup using the Windows Control Panel.

The student is guided through each assignment by a CARA on-screen manual that gives details of the work to be completed and presents questions for the student to answer.

Each assignment has an optional Enrichment Activity, in which guidance on further reading is given using the Textbook 'A+ Exam Prep'.

The workstation will require a student workstation PC on which to run the on-screen assignments and answer the questions.

Assignment Content

1 **Hazards to the Computer**
Theory Computer hazards and prevention
Practical Identify components in the system unit

2 **Assembling a Personal Computer**
Theory Computer Assembly, System Unit and Motherboard
Practical Find out how to assemble and test a Personal Computer
Restoring the Hard Drive

3 **Installing Windows on the Computer**
Theory Microprocessor features and operation
Practical Installation of the Windows operating system

4 **Setting Up the Computer**
Theory BIOS features and operation
Practical Installation of drivers for motherboard, video, and sound

5 **Exploring the Windows Desktop**
Practical Windows Desktop features and operation

6 **Customizing Windows using the Control Panel**
Practical Customizing Windows operating system

7 **Peripheral Devices**
Theory Mouse, Keyboard, and Monitor features and operation
Practical Connecting the Mouse, Keyboard, and Monitor

8 **More Peripheral Devices**
Theory Sound cards, Game ports, and USBs
Practical Connecting a USB device

9 **Power in the PC**
Theory Power supply connections and operation
Practical Verifying and measuring power supply connections

10 **Floppy Drives**
Theory Floppy drives features and operation
Practical Replacing the Floppy drive and creating disk copies

11 **Adding an Additional Hard Drive**
Theory Hard drives features and operation
Practical Installing, partitioning, and formatting a Hard Drive

12 **Backing Up Files**
Theory Data storage devices
Practical Installing MS BackUp, replacing CD-ROM, and restoring backed up files

13 **Memory Management Using Windows**
Theory Memory components features and operation
Practical Virtual Memory and additional memory module

14 **Imaging**
Theory Graphic cards and display units
Practical Installing a graphics card and create images using a scanner

15 **Application Software Installation**
Theory Computer Viruses
Practical Installing and using an AntiVirus application

16 **Printers**
Theory Printer features and operation
Practical Connecting a printer and producing a test printout

17 **Installing a Fax Modem**
Theory Data transfer using a phone line
Practical Inserting and testing a Modem card
Creating an Internet connection

18 **Portable Computers**
Theory Portable display technology
Practical Identifying portable computer components

19 **PC Maintenance Tools**
Theory General computer maintenance
Practical Hard drive, CD-ROM drive, and Floppy drive maintenance

20 **Hard Drive Tools**
Theory Hard drive features and operation
Practical Defragment, compress, and reformat a hard drive

D5507 A+ Theory Support

In this module the student uses a set of four training CD-ROMs to research and investigate computer operating systems and networks.

The four main topic areas are:
- Navigating Windows 95
- Navigating DOS and Windows 3.x
- Navigating Windows NT 4.0 Workstation
- LANs, WANs and the Internet

In each assignment the student is presented with a series of questions relating to a main topic area. Each question includes a hint giving an indication of where to look on the CD-ROMs to research the answer.

The student is guided through each assignment by a CARA on-screen manual. This gives details of the work to be completed and presents the questions for the student to answer.

The workstation requires a student workstation PC on which to run the on-screen assignments and answer the questions.

Assignment Content

Navigating Windows 95

1 Implementing Windows 95

2 Windows 95 User Interface

3 Implementing Networking

4 Hardware Management

5 Software Management

6 Printing with Windows 95

Navigating DOS and Windows 3.x

7 Disk Operating System

8 System Optimization Under MS-DOS

9 Windows 3.1 (Part 1)

10 Windows 3.1 (Part 2)

Navigating Windows NT

11 Installing Windows NT Workstation

12 Part 1 - Navigating the User Interface
Part 2 – Windows NT Hardware Management

13 Windows NT Software Management (Part 1)

14 Windows NT Software Management (Part 2)

15 User and Security Management (Part 1)

16 User and Security Management (Part 2)

LANs, WANs and the Internet

17 Computer Networks: An Overview

18 Networks: Communication

19 Network Connectivity Devices

20 About the Internet

D5508 A+ Exam Preparation

This module is aimed at ensuring that students are fully prepared for taking the A+ Exam. It contains the A+ Exam Cram and A+ Exam Practice Tests textbooks.

The first 3 hours of this module provides the student with A+ Core and A+ DOS/Windows question banks from the A+ Practice Tests textbook. Using the results of these questions, the student can determine whether they need to study certain areas of the A+ course further, prior to taking the actual A+ Exam. The A+ Exam Cram Book can then be used for this additional study.

The last 3 hours of this module provides the student with on-screen A+ Core and A+ DOS/Windows practice exams from the A+ Exam Practice Tests CD-ROM provided with the A+ Practice Tests textbook. Once the practice exam is complete, the students can automatically grade their work and review answers, enabling them to see where any incorrect answers were.

Each workstation will require a student workstation PC on which to run the on-screen practice tests and answer the questions set in the question banks.

Installing the A+ Pod Modules

The D5505, D5506, and D5507 modules should each be set up and installed at a student workstation containing a student workstation PC. The software for the module should be installed and run on these PCs.

The D5506 module requires space for the D5506 computer to be setup alongside the student workstation PC. Sufficient workspace needs to be provided to allow the student to open the system unit case and work inside. Additional peripherals, such as a printer and scanner, will also be attached and again sufficient space needs to be provided to allow these peripherals to be setup alongside the D5506 computer.

The D5506 computer requires access to 3 electrical power outlets, for the system unit, monitor, and peripheral devices. The peripheral devices are only individually during the module, so only one needs to be connected to a power outlet at any one time.

Installation instructions for the modules used in the A+ Pod are given in the Instructor's Guide for each module.

Reporting using Class*Act*

Using the Class*Act* Computer Managed Learning System, the Instructor is able to monitor the progress of a student as they work through the modules of the training program.

Included with each module are reports that the instructor can use to assess the ability of the student before and after they work through the module.

All questions answered using the Class*Act* system are linked to competency objectives which describe the skills and knowledge that a student should obtain by completing a module. In a report, grades are awarded for each competence objective which are determined from the percentage of correct responses for the questions linked to that objective.

Instructions on generating reports are contained in the Class*Act* Laboratory Management Guide ST520 supplied with the Class*Act* software. This also gives details of the various settings that can be changed to alter the layout and information included in a report.

On the following pages are examples of the Class*Act* reports available, indicating how to interpret the information contained within them.

The Entry Report

A Pre-Test is provided with each module, which can be used to assess the student's knowledge before working through the module.

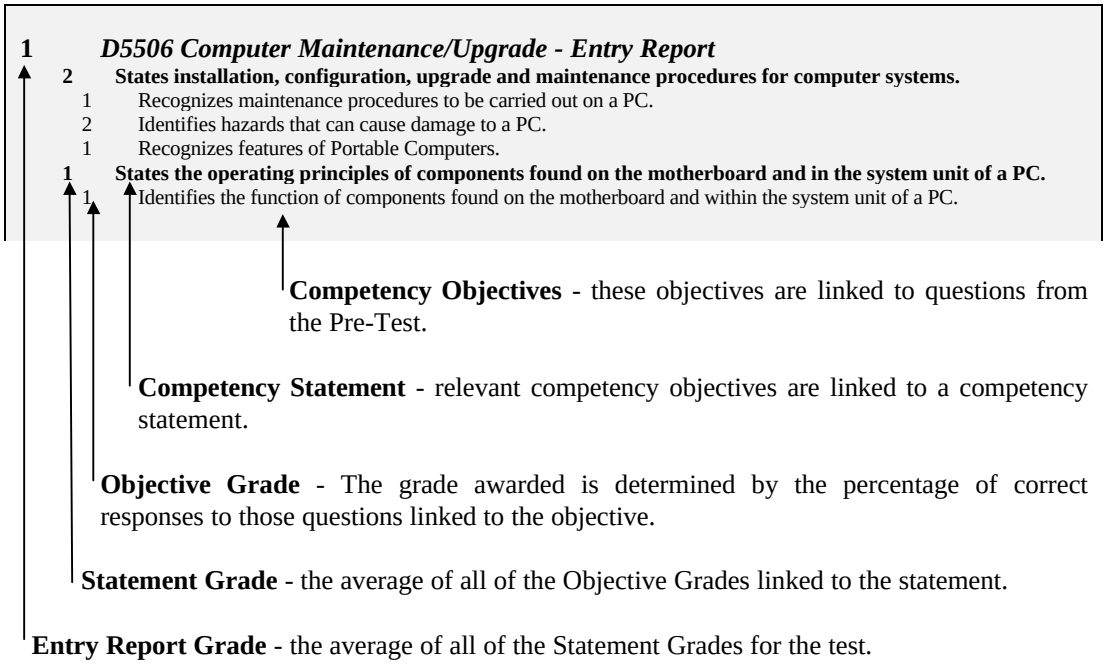
When the student has completed the assignments and the Post Test, the knowledge gained by working through the module can be assessed by comparing the Post Test result with the Pre-Test result.

The Entry Report is competence-based report and is graded using the following grade structure:

Grade	Grade Description
3	Can work independently
2	Requires limited instruction
1	Requires close instruction
-	Not worked on

Understanding an Entry Report

An example of an Entry Report, generated using a competence grade structure is shown below.



In the above example, the student has shown only limited knowledge of the module.

The Exit Report

When the student has completed all of the Assignments and the Post Test for the module, the instructor can generate a competence-based Exit Report using the results of the Assignments and the Post Test.

This report will assess the student's knowledge, based on all of the questions that they have answered in the Assignments and the Post Test.

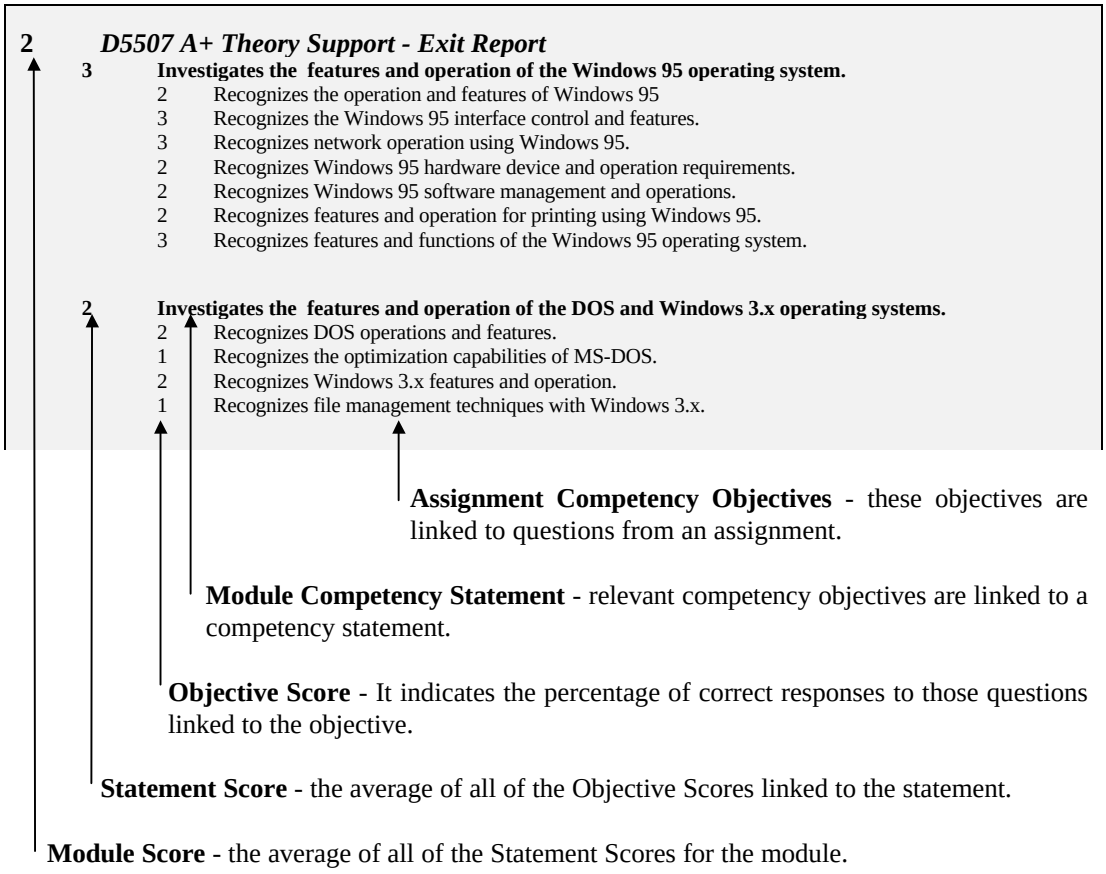
The Exit Report can be used to identify areas where the student still has limited knowledge of the subject. Appropriate remedial work can then be set for the student to complete before continuing.

The Exit Report is competence-based report and is graded using the following grade structure:

Grade	Grade Description
3	Can work independently
2	Requires limited instruction
1	Requires close instruction
-	Not worked on

Understanding an Exit Report

An example of an Exit Report, generated using a competence grade structure is shown below.



In the example above it can be seen that the student has a good understanding of the features and operation of the Windows 95 operating system (grades 2 or 3), but they have limited knowledge of the features and operation of the DOS and Windows 3.x operating systems (grades 1 or 2).

The Score Report

The *Score Report* is designed so that the instructor can monitor a student's progress as they work through a module. The report provides a percentage score for each assignment and for the Pre- and Post Tests.

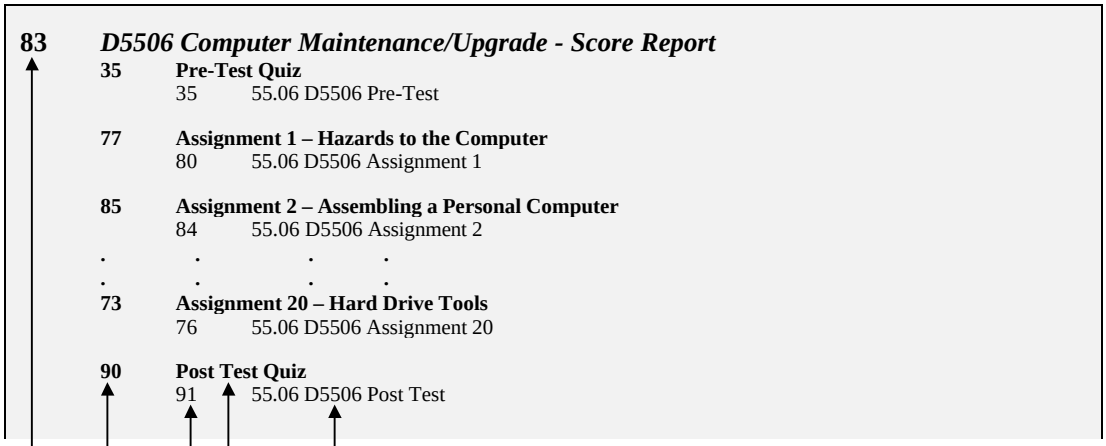
The score report can be generated for an individual student, or be used to monitor and compare the progress of a whole class.

The score for each assignment is the average of all of the scores from the chapters of work completed for that assignment.

A module score is also given, being calculated using a weighted average of the Assignment scores and the Post Test score, based on a relative weighting of 60 : 40. The Pre-Test score have no effect on the module score and is included in the Score Report for information only.

Understanding a Score Report

An example of a Score Report generated for a *student*, using a percentage grade structure.



Individual Assignments completed in an Assignment – this will typically be only one assignment.

Assignment Title

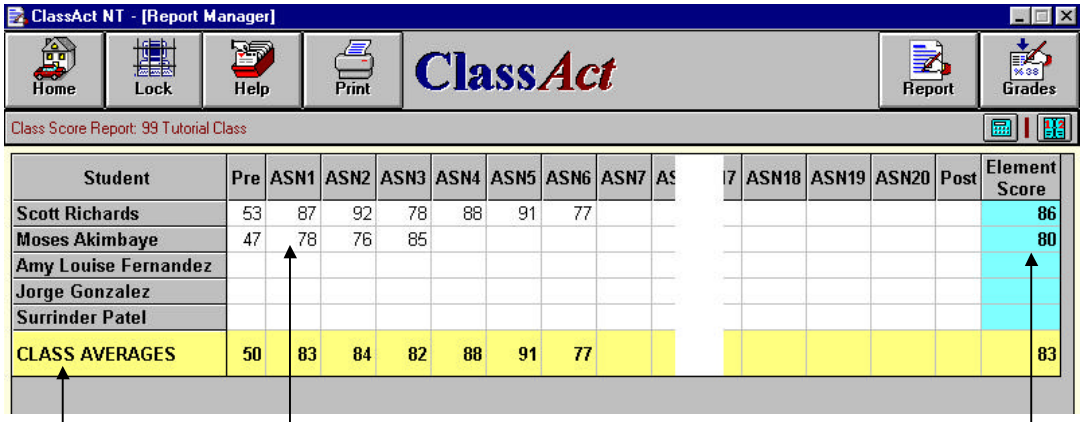
Individual Assignment Score - It indicates the percentage of correct responses to those questions contained in the assignment.

Overall Assignment Score - the average of all of the Individual Assignment Scores completed in that assignment.

Module Score - the overall score for the module, determined from the individual Assignment Scores with the weighting for each taken into account.

Understanding a Class Score Report

An example of a Score Report generated for a *class*, using a percentage grade structure.



Student	Pre	ASN1	ASN2	ASN3	ASN4	ASN5	ASN6	ASN7	AS	I7	ASN18	ASN19	ASN20	Post	Element Score
Scott Richards	53	87	92	78	88	91	77								86
Moses Akimbaye	47	78	76	85											80
Amy Louise Fernandez															
Jorge Gonzalez															
Surrinder Patel															
CLASS AVERAGES	50	83	84	82	88	91	77								83

Assignment Score - the scores obtained for the assignment.

Element Score - the overall score for the module, determined from the individual Assignment Scores with the weighting for each taken into account.

Class Averages - Allows comparisons to be made between a student's score and the average score of the class.

The Class Report as shown above is a useful way of tracking a student's progress through a module.