

MODULE TITLE	INDUSTRIAL COMPUTER SYSTEMS
Nominal duration	One Module
Module code or number	EA 903
Module purpose	To provide students with initial training in computer applications to enable them to use PC operating systems and applications in an engineering environment, with a strong emphasis on applications relevant to instrumentation & control systems engineering.
Relationship to competency standards	<p>This module will be modified in line with the requirements of the National Metals and Engineering Standards when they become available.</p> <p>The module contains the knowledge and skills identified and agreed by all states/territories. It has been developed on the assumption that these will be reflected in the Standards.</p>
Prerequisites	EA 904 Control concepts
Summary of Content	<ul style="list-style-type: none">- computer systems Overview- PC hardware Orientation- Basic DOS Commands- DOS Set-Up & Utilities- Windows Operations- Word Processors- Spreadsheets- Databases as used for control applications- CAD/Vector Graphics- Introduction to a control application package
Delivery	This module can be taught in a TAFE college computing facility, or by external study. A suitable teaching strategy would be combined theory/practical lessons.

Learning outcomes	On completion of this module the learner will be able to:
<i>Learning Outcome 1</i>	Use PC operating systems
Assessment criteria	<p>1 Uses PC, DOS and Windows terminology including; PC memory map, conventional memory, HMA, video memory, extended memory, expanded memory, XMA, POST, BIOS, execution thread, interrupt vectors, hardware interrupts, software interrupts, int21h interface, real mode, standard mode, protect mode, enhanced mode, virtual machine, virtual memory, DOS box, re-entrant, multiuser, multitasking, pre-emptive, DLL.</p> <p>2 Uses DOS file commands</p> <p>3 Uses DOS utility commands</p> <p>4 Uses DOS batch commands</p> <p>5 Uses CUA interface efficiently</p> <p>6 Transfers information in Windows by pasting, DLE and OLE</p>
Conditions	<p>This outcome should be assessed in sufficient depth to ensure students are able to efficiently use a PC operating under DOS or Windows, as regards to an industrial control environment including;</p> <ul style="list-style-type: none">• Knowledge of terminology• DOS command line usage• Overview of DOS & Windows OS services• DOS batch files• Windows usage
Assessment method	Completion of a Practical test and a paper or computer based theory test.

Learning Outcome 2**Set up PC**

Assessment criteria

- 1 Identifies principal hardware components of a PC.
- 2 Specify PC systems, including processors, disks, video, memory, cache.
- 3 Identifies and installs adaptor boards, including noting resource usage and driver installation.
- 4 Specifies the purpose of DOS utilities, including HIMEM.SYS, SMARTDRV.SYS, EMM386.SYS.
- 5 Installs DOS, including config.sys & autoexec.bat setup.
- 6 Installs Windows, including any modifications of win.ini and system.ini required.
- 7 Records configuration information (eg. within case), backs up installation disks and implements on-going back-up strategies.

Conditions

This outcome should be assessed in sufficient depth to give students a true indication of their ability to set up a PC, including:

- Specification of PCs.
- Recognising and overcoming common installation difficulties.
- Implementing on-going maintenance.

Assessment method

Completion of a practical test.

Learning Outcome 3

Use PC applications in an engineering environment

Assessment criteria

- 1 Uses a word processors, including styles, templates, macro's and merging of date, to present engineering data in a standard format.
- 2 Uses a spreadsheet, including data entry, format, calculations and macro's, to perform engineering calculations on a "what-if" basis.
- 3 Uses a single table databases, including data entry, reports, views and queries, to organise engineering information (eg. instrument tag lists).
- 4 Uses CAD to produce simple engineering drawings.
- 5 Link information between Windows versions of word processor, spreadsheet & database.
- 6 Produce standard merged CAD drawings from database, with particular emphasis on databases and drawings for industrial systems.

Conditions

As far as possible, component skills should be learnt independently, and undertaken in any order. This outcome should be assessed so as to give students an indication of their ability to access PC applications such as:

- Microsoft Word, Excel and Access, or equivalents.
- Auto Cad, a control graphics system like Geneses or equivalent.

Assessment method

Practical assignments.

Suggested learning resources

Primary:

PC with DOS & Windows per student
PC Application packages (noted above)

Additional:

Fulcher, "Introduction to microcomputer systems, architecture & interfacing", Addison-Wesley.