How much microprocessor study should be compulsory in an IT degree?

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The question embodied in the title of this paper has been occupying the staff at Otago Polytechnic's BIT degree for several years. Our current response is "Microware". Microware is a new course introduced into the Bachelor of Information Technology degree at Otago Polytechnic in 2001.

We have always had a strong embedded microprocessor and control technology stream in our degree. We expect by year three, the students taking this stream will be very strong in microprocessor fundamentals and assembly language programming. But we were finding that with the introduction of the major microprocessor course in year two, the students took a long time to get up to speed and did not have strong mastery of the assembler and microprocessor fundamentals even at the end of this course. One solution we tried for three years was to make IT204 Microprocessors compulsory. This was one of the orginal Waikato Polytechnic BInfoTech courses introduced over seven years ago. This subject had a low pass rate and did not always suit students going on to our software and higher level language areas.

Our current solution is to offer a new subject called MW106 Computer Processor Hardware and whose broad outline as follows:

Level 100 COMPULSORY **(1 Credit)**

Related Units: CT204, NE310, SP312, IT317

Prerequisite Units: None

Purpose: This course aims to illustrate the elementary relationships between computer hardware and software. Simple examples will be used to illustrate important conventions and popular products.

Assessment: Theory and practical test and assignment.

Performance Criteria:

The binary level: Representation of information in binary, Compiling, interpreting byte codes, Some software that examines files – codexdate, Assembly language, Some assembler issues, Addressing, interrupts, threads.

The processor: The nature of a machine code instruction, Bus cycles**,** The instruction set – some choices and compromises, Memory maps, Timing diagrams, An embedded processor's functions, A desktop's processor's functions.

Hardware interfacing: Physical connections, Protocol overview eg RS232, Centronics, USB., Ports and hardware addressing, Some common peripherals and cards, Simple independently powered device, correctly interfaced.

Students concentrate on the Atmel AVR device. This family has a 'nice' instruction set and a full complement of tools integrated into a free product called AVR studio. The students find this an excellent simulator to learn their programming on.

Advantages

All students learn a little bit about hex assembler and microprocessors

Some assumptions can be made in second and third years about at least some of the elementary knowledge in this area.

Greater depth in year three because much of the groundwork is done in years one and two.

Disadvantages

. We had to drop a subject to create a gap for microware.

. Some students still find the area very difficult and perhaps they would be better off studying more software.

Some setting up and assessment issues

Conclusion

Our new Microware course is an adequate response to the question posed in the title and we