Unit Outline: KXA152 Computer Organisation and Architecture

Semester 2, 2004

North West Centre, Burnie
Sandy Bay Campus, Hobart
Newnham Campus, Launceston

Prerequisites
None

Corequisites
None

Unit Weight
12.5% of one academic year

Unit Coordinator
Ian Lewis

Lecturing Staff
Newnham Campus, Launceston: Ian Lewis
North West Centre, Burnie: Ian Lewis
Sandy Bay Campus, Hobart: Ian Lewis

Scheduled Teaching Sessions
Lectures: 3 hr/wk
Tutorials: 1 hr/wk (from week 2)
The Unit Timetable can be accessed from the Study Resources section of the School website. (http://www.comp.utas.edu.au/app/studyresources.jsp).
Lectures for North West Centre students will be via video conference.

Unit Website
The unit website is accessed from http://webct.utas.edu.au:8900/. You will need to use your university email pop account username and password to log on to the WebCT system. Once authenticated by the system your personalised MyWebCT area will be displayed. It contains links to the websites that you have permission to access - including the website for this unit.
This unit is Web Dependent: content & communication. This means that you will need to use the Web for this unit. The unit website contains unit information and resources.

If you are not able to access the unit website, please contact the University IT help desk:
Entrance Level, Morris Miller Library, Sandy Bay Campus;
Entrance Level, Launceston Campus Library, Newnham Campus.
Telephone: 6226 1818 and 1300 304 903.
Email: servicedesk@utas.edu.au
Website: http://www.utas.edu.au/servicedesk/student/index.html

University Website
Information and Resources for 'Current Students' are available on the university website at: http://www.utas.edu.au/students/

Provider
School of Computing - Faculty of Science, Engineering, and Technology. http://www.comp.utas.edu.au

OVERVIEW

Introduction
This unit introduces the structure and function of digital computers by reviewing their typical major components and the interconnection and interaction of those components. The unit reviews the features of digital computer instruction sets; and provides some experience with programming in machine code and in assembly code.

Learning Outcomes
On successful completion of this unit, you will be able to:

1. Demonstrate an understanding of computer organisation and architecture
2. Apply knowledge of computer organisation and architecture to previously unseen architectures
3. Compare similar architectures and their organisations
4. Demonstrate knowledge of historical and current developments in computers and likely future trends
5. Understand the functions of the major components of a digital computer
6. Describe the main features of instruction execution and sequencing
7. Demonstrate knowledge of data flow and device control
8. Describe basic aspects of data storage at various levels
9. Operate and program a basic computer at the machine level
**Unit Content**

The weekly three hours of lectures will present both materials from the suggested text as well as from a variety of other sources to the following basic schedule:

- **Week 1**: Introduction and computer history
- **Weeks 2/3/4**: Introduction to course content, and major components: CPU, memory, bus, and cache
- **Weeks 5/6**: Using a CPU: programming issues, instructions, addressing, and arithmetic
- **Weeks 7/8**: External interface: I/O, controllers, devices, secondary storage, graphics cards
- **Weeks 9/10**: CPU internals: optimisation
- **Weeks 11/12**: Specific examples and comparisons of architecture and organisations
- **Week 13**: Course review and exam preparation

For more information see the section titled 'Content' on the unit website.

**Generic Skills**

The university has defined a set of generic graduate attributes expected in its graduates. [http://www.admin.utas.edu.au/HANDBOOKS/UTASHANDBOOKS/RULES/POLGEN.html](http://www.admin.utas.edu.au/HANDBOOKS/UTASHANDBOOKS/RULES/POLGEN.html) Your course is designed to enable you to develop generic skills that are valued in, and expected of, graduates. These are skills that you will need to develop over time. Hence you are encouraged to look for opportunities, as you study each unit, to reflect on and improve these skills.

**LEARNING AND TEACHING**

**Approach to Learning**

You are expected to spend about 130 hrs studying in this unit - this includes attendance at scheduled teaching sessions. (For a 13 week semester this is, on average, 10 hr/wk.) This is the amount of study time that the 'typical' student will need to reach the level of competence and understanding required to fulfil the unit objectives.

You are expected to:

- attend all scheduled lectures and tutorials, unless otherwise notified by the unit coordinator
- prepare for, and actively participate in lectures and tutorials
- complete the assigned learning tasks
- review what has been learnt
- complete assessment items and submit them on time
- access and be familiar with the information and resources available on the unit website
- seek help from teaching staff if you have any questions or difficulties in studying this unit

You are encouraged to read the university's *Code of Conduct for Teaching and Learning*. Part A describes the 'Responsibility of the University to Students' and part B describes the 'Responsibilities of Students to the University'. [http://www.admin.utas.edu.au/HANDBOOKS/UTASHANDBOOKS/RULES/CTEA.html](http://www.admin.utas.edu.au/HANDBOOKS/UTASHANDBOOKS/RULES/CTEA.html)

**Schedule**

See the 'Schedule' section on the unit website.

**Teaching and Support Staff**

**Teaching Staff**

**Unit Coordinator:**

Ian Lewis  
E-Mail: LJ.Lewis@utas.edu.au  
Phone: (03) 6226 2952  
Room: 465, Sandy Bay Campus, Hobart

**Lecturing Staff**

Newnham Campus, Launceston: Ian Lewis  
North West Centre, Burnie: Ian Lewis  
Sandy Bay Campus, Hobart: Ian Lewis

**School Help Desk**

Contact the School Help Desk if you have any queries or problems with accessing, using, or printing from the computers in the School of Computing labs.

- **Hobart**: the Help Desk is located near the School's reception desk and is open in the morning from 9-11, and in the afternoon from 12-1 and 2-4, Monday-Friday. The phone number is 6226 2960.
- **Launceston**: the Help Desk is located near the entrance to the computing labs and is open in the morning from 10-12, and in the afternoon from 2-4:30, Monday-Thursday. On Fridays it is open from 10-12 in the morning and 2-4 in the afternoon. The phone number is 6324 3447.
- **Burnie**: the computer labs at the NWC are maintained by ITS. Please contact the University Help
University Services and Support

The University has staff available to assist you, such as the:

- Learning Development Advisor
- Student Counselor
- Careers Advisor
- Disability Officer

For more information and contact details see the Services and Support section on the University 'Current Students' web page. [http://www.utas.edu.au/students/](http://www.utas.edu.au/students/)

Resources

Unit Website

The unit website contains unit information and resources.

Prescribed Text


Software

The software that you will need to access the unit website and to study this unit, including general purpose software such as word processors, is provided on the computers in the School's computing labs. If you intend to use software on other computers please check that the versions are compatible.

Computing Facilities

The School has PC labs (Windows XP), Mac labs (Mac OS-X 10.3), and Networking labs at the Newnham and Sandy Bay campuses. It also maintains 6 Macs (Mac OS-X 10.3) at the NW Centre. Unix accounts can be accessed from all Macs and PCs.

If you have not used these facilities before please contact the School Help Desk to organise your account details. If you would like to access the facilities at the Newnham and Sandy Bay campuses after hours please contact the School Help Desk.

Please contact the School Help Desk if you have difficulty accessing or using these facilities.

Use of Facilities

Use of computing facilities provided by the School is subject to the School's Ethics Guidelines - [http://www.comp.utas.edu.au/app/ethics.jsp](http://www.comp.utas.edu.au/app/ethics.jsp). Copies of the guidelines are also available in all School labs. The School's facilities may only be used for study-related purposes, and may not be used for personal gain. The playing of games is strictly prohibited in all labs at all times. Before being granted access to the School's facilities, you will be required to sign a declaration that you have read and understand these guidelines, and that you will abide by them. Disciplinary action may be taken against students who violate the guidelines.

Occupational Health and Safety

The university is committed to providing a safe and secure teaching and learning environment. For more information see [http://www.admin.utas.edu.au/hr/ohs/pol_proc/](http://www.admin.utas.edu.au/hr/ohs/pol_proc/)

ASSESSMENT

Assessment Items

**Item 1**

- **Title:** Assignment
- **Type:** In-Semester - individual assignment
- **Weighting:** 15%
- **Due:** Friday at 5 pm in Week 11 of the semester

**Item 2**
Title: Tutorial Work
Type: In-Semester - learning tasks
Weighting: 15%
Due: During semester

**Item 3**

Title: 3 hr examination
Type: Formal Examination
Weighting: 70%
Due: University Examination Period

See the 'Assessment' section in unit website for more detailed information about assessment items.

### In-Semester Assessment

Unless specifically stated in the specification of the assessment item provided on the unit website, it is required that:

- work submitted by a student is the work of that student alone OR
- where the assessment item is to be completed by a group of students, the work submitted by the group of students is the work of that group of students alone.

### Plagiarism

Plagiarism is a form of cheating. It is taking and using someone else's thoughts, writings or inventions and representing them as your own, for example:

- using an author's words without putting them in quotation marks and citing the source;
- using an author's ideas without proper acknowledgment and citation; or
- copying another student's work.

**If you have any doubts about how to refer to the work of others in your assignments, please consult your lecturer or tutor** for relevant referencing guidelines, and the academic integrity resources on the web at [http://www.utas.edu.au/tl/supporting/academicintegrity/index.html](http://www.utas.edu.au/tl/supporting/academicintegrity/index.html).

The intentional copying of someone else’s work as one’s own is a serious offence punishable by penalties that may range from a fine or deduction/cancellation of marks and, in the most serious of cases, to exclusion from a unit, a course or the University. Details of penalties that can be imposed are available in the Ordinance of Student Discipline – Part 3 Academic Misconduct, see [http://www.utas.edu.au/policy/subject.html#students](http://www.utas.edu.au/policy/subject.html#students).

The University reserves the right to submit assignments to plagiarism detection software, and might then retain a copy of the assignment on its database for the purpose of future plagiarism checking.

### Referencing

The university document on plagiarism contains information about referencing the work or ideas of others. (See [http://www.utas.edu.au/plagiarism/](http://www.utas.edu.au/plagiarism/).) The preferred text referencing systems for the School is the Harvard system (also referred to as the author-date system).

### Submissions

All in-semester assignment submissions (including electronic submissions) are to include an Assignment Cover Sheet which includes a statement confirming that the submission is your own work. If this undertaking is not signed, the assignment will not be marked. The Assignment Cover Sheet is available from the School Help Desk in Launceston and Hobart, and on the School's web site [http://www.comp.utas.edu.au/app/studyresources.jsp](http://www.comp.utas.edu.au/app/studyresources.jsp).

### Extensions

Assessment items will not be accepted after the due date except under the conditions stated in the school policy on late assessment, [http://www.comp.utas.edu.au/app/late_assess.jsp](http://www.comp.utas.edu.au/app/late_assess.jsp).

### Formal Examination

The formal examination is conducted by the University Registrar. The 'Current Students' section on the university website contains information about the conduct of, and timetable for, formal examinations.

### Final Grade

Overall assessment will be based on the student's performance throughout the semester as well as in a
formal examination. In order to achieve a pass (or better) result, a student must obtain:

1. at least 40% of the total mark for in-semester assessment items
2. at least 40% of the mark for the formal examination
3. at least 50% of the overall mark

Passing grades will be awarded based on the AVCC guidelines:

- PP at least 50% of the overall mark but less than 60%
- CR at least 60% of the overall mark but less than 70%
- DN at least 70% of the overall mark but less than 80%
- HD at least 80% of the overall mark

The maximum mark awarded to a student who fails the unit will be 44.

For more information, including other grades such as Supplementary and Terminating grades, see the School of Computing's guidelines for assessment - available at: http://www.comp.utas.edu.au/app/assess.jsp