



MONASH University
Information Technology

FIT5174
Parallel and distributed systems

Unit Guide

Semester 2, 2010

The information contained in this unit guide is correct at time of publication. The University has the right to change any of the elements contained in this document at any time.

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FIT5174 Parallel and distributed systems - Semester 2, 2010

Modern computer systems contain parallelism in both hardware and software. This unit covers parallelism in both general purpose and application specific computer architectures and the programming paradigms that allow parallelism to be exploited in software. This unit examines both shared memory and message passing paradigms in both hardware and software; concurrency, multithreading and synchronicity; parallel, clustered and distributed supercomputing models and languages. Students will program in these paradigms.

Mode of Delivery

Clayton (Day)

Contact Hours

2 hrs lectures/wk

Workload

Workload commitments for FIT5174 are:

- two-hour lecture
- one-hour unsupervised tute in the MUSE lab (G.16/Bldg 26, Clayton) to work on assignments, any hurdles etc, and contact lecturer on campus if required
- upto 3 hours / week of preparation/personal study including lecture material
- upto 3 hours / week surveying existing literature in the library, on-line resources etc; hands-on lab exercises
- a minimum of 4 hours / week per 2 hour contact time in order to satisfy the reading and assignment expectations

Unit Relationships

Prohibitions

CSE4333

Prerequisites

Recommended knowledge: operating systems, including synchronisation and interprocess communication mechanisms; advanced computer architecture, including pipelining techniques.

Chief Examiner

Asad Khan

Campus Lecturer

Clayton

Dr Asad Khan

Learning Objectives

At the completion of this unit students will have:

- knowledge of a variety of parallel architectures, such as bus-based, massively parallel, cluster, vector;
- knowledge of a variety of parallel programming paradigms, synchronisation and parallelisation primitives, message passing, data parallel, tuple space;
- understanding of concurrency, synchronicity and parallelism;
- understanding of the design issues of parallel systems;
- skills in designing, developing and debugging parallel programs using a variety of paradigms.

Graduate Attributes

Monash prepares its graduates to be:

1. responsible and effective global citizens who:

- a. engage in an internationalised world
- b. exhibit cross-cultural competence
- c. demonstrate ethical values

critical and creative scholars who:

- a. produce innovative solutions to problems
- b. apply research skills to a range of challenges
- c. communicate perceptively and effectively

Assessment Summary

Assignments: 100%

Assessment Task	Value	Due Date
Distributed Systems - Assignment 1 of 2	25%	Mon 16/Aug, 12PM (week05)
Distributed Systems - Programming Assignment 2 of 2	25%	Mon 13/Sep, 12PM (week9)
Parallel architectures Assignment	25%	Fri 15/Oct, 12PM (week12)
Parallel architectures class test (during the lecture)	25%	Week 12 lecture slot

Teaching Approach

Feedback

Our feedback to You

Types of feedback you can expect to receive in this unit are:

Your feedback to Us

Monash is committed to excellence in education and regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through SETU, Student Evaluation of Teacher and Unit. The University's student evaluation policy requires that every unit is evaluated each year. Students are strongly encouraged to complete the surveys. The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

For more information on Monash's educational strategy, and on student evaluations, see:

<http://www.monash.edu.au/about/monash-directions/directions.html>

<http://www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html>

Previous Student Evaluations of this unit

If you wish to view how previous students rated this unit, please go to

<https://emuapps.monash.edu.au/unitevaluations/index.jsp>

Unit Schedule

Week	Date*	Activities	Assessment
0	12/07/10		
1	19/07/10		
2	26/07/10		
3	02/08/10		
4	09/08/10		
5	16/08/10		
6	23/08/10		
7	30/08/10		
8	06/09/10		
9	13/09/10		
10	20/09/10		
Mid semester break			
11	04/10/10		
12	11/10/10		
	18/10/10		

*Please note that these dates may only apply to Australian campuses of Monash University. Off-shore students need to check the dates with their unit leader.

Assessment Policy

To pass a unit which includes an examination as part of the assessment a student must obtain:

- 40% or more in the unit's examination, and
- 40% or more in the unit's total non-examination assessment, and
- an overall unit mark of 50% or more.

If a student does not achieve 40% or more in the unit examination or the unit non-examination total assessment, and the total mark for the unit is greater than 50% then a mark of no greater than 49-N will be recorded for the unit

Assessment Tasks

Participation

• Assessment task 1

Title:

Distributed Systems - Assignment 1 of 2

Description:

A theoretical assignment in the form of a research paper.

Weighting:

25%

Criteria for assessment:

Demonstrate through your submission, the theoretical understanding of multi-process algorithms.

Due date:

Mon 16/Aug, 12PM (week05)

• Assessment task 2

Title:

Distributed Systems - Programming Assignment 2 of 2

Description:

Write parallel programs using message passing.

Weighting:

25%

Criteria for assessment:

Demonstrate through your submission, the practical skills in developing parallel distributed applications.

Due date:

Mon 13/Sep, 12PM (week9)

• Assessment task 3

Title:

Parallel architectures Assignment

Description:

In this assignment you are asked to write a research paper on how high performance machines are applied to a range of different application areas. You should read sufficient material to give you some understanding of the outcomes for the area, and the underlying computational methods (for example, the numerical methods involved, or the computer science algorithms employed) and how it is solved using a high performance computer.

Weighting:

25%

Criteria for assessment:

Each case study should contain the following sections:

1. A description of the problem.
2. The science or engineering outcomes of the application.
3. How the problem is solved on parallel machines.

Marks will be allocated, roughly equally, against the application areas listed in the assignment specification. Further marks will be allocated for the length of the paper (against the word limit) and the number of references.

Students should see the assignment specification for more detailed description of the requirements.

Due date:

Fri 15/Oct, 12PM (week12)

• **Assessment task 4**

Title:

Parallel architectures class test (during the lecture)

Description:

Students will be given a 60 minutes class test, based on the parallel architecture lecture notes, comprising several short questions.

Weighting:

25%

Criteria for assessment:

Demonstration of knowledge (understanding) gained during the weekly lectures in parallel architectures.

Due date:

Week 12 lecture slot

Examinations

Assignment submission

Assignment coversheets are available via "Student Forms" on the Faculty website:

<http://www.infotech.monash.edu.au/resources/student/forms/>

You MUST submit a completed coversheet with all assignments, ensuring that the plagiarism declaration section is signed.

Extensions and penalties

Submission must be made by the due date otherwise penalties will be enforced.

You must negotiate any extensions formally with your campus unit leader via the in-semester special consideration process:

<http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>.

Returning assignments

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later

Policies

Monash has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and to provide advice on how they might uphold them. You can find Monash's Education Policies at:

<http://policy.monash.edu.au/policy-bank/academic/education/index.html>

Key educational policies include:

- Plagiarism
(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-policy.html>)
- Assessment
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/assessment-in-coursework-p>)
- Special Consideration
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.h>)
- Grading Scale
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/grading-scale-policy.html>)
- Discipline: Student Policy
(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-discipline-policy.html>)
- Academic Calendar and Semesters (<http://www.monash.edu.au/students/key-dates/>);
- Orientation and Transition (<http://www.infotech.monash.edu.au/resources/student/orientation/>);
and
- Academic and Administrative Complaints and Grievances Policy
(<http://www.policy.monash.edu/policy-bank/academic/education/management/complaints-grievance-policy>)

Student services

The University provides many different kinds of support services for you. Contact your tutor if you need advice and see the range of services available at www.monash.edu.au/students The Monash University Library provides a range of services and resources that enable you to save time and be more effective in your learning and research. Go to <http://www.lib.monash.edu.au> or the library tab in my.monash portal for more information. Students who have a disability or medical condition are welcome to contact the Disability Liaison Unit to discuss academic support services. Disability Liaison Officers (DLOs) visit all Victorian campuses on a regular basis

- Website: <http://adm.monash.edu/sss/equity-diversity/disability-liaison/index.html>;
- Telephone: 03 9905 5704 to book an appointment with a DLO;
- Email: dlu@monash.edu

- Drop In: Equity and Diversity Centre, Level 1 Gallery Building (Building 55), Monash University, Clayton Campus.