CSCI222/MCS9222

Systems Development

Subject Introduction

Who am I?

- Hoa Khanh Dam
  - PhD in Computer Science - RMIT University, Australia
  - M.App.Sc. in Information Technology - RMIT University
  - Bachelor of Computer Science - The University of Melbourne
- Previous positions:
  - Technical Architect / Project Manager at B.A.O. Solutions
  - Software Engineer at Exari Systems.
- Some of my research interests that you may be interested:
  - Managing consistency between different parts of the software.
  - Merging software versions
  - Data-driven software engineering.

More info at http://www.uow.edu.au/~hoa

CSCI222 – Autumn and Spring

- **Should you be here this session?**
- **CSCI222 is scheduled for both Autumn and Spring**
- **CSCI204 is a pre-requisite for CSCI222**
  - **(If you enrol with only CSCI124, you will be marked as "provisional" and will be disenrolled later in session.)**

Systems Development

- Lectures:
  - Monday 15:30-17:30
  - Thursday 17:30-18:30
- Laboratory:
  - Wednesday 10:30-12:30
  - Friday 15:30-17:30

Lecturers

- Dr Hoa Dam
  - Office: 3.201 (consultation hours only)
  - Consultation time:
    - Monday 10:30 – 12:30
    - Thursday 10:30 – 12:30
  - Email: hoa@uow.edu.au
- Tutor: Daniel Avery

Email notes

Avoiding the junk filter

- Use your UoW account
- Made subject relevant
  - Eg CSCI222 task analysis assignment question
- Provide a heading
- Make sure language is set to English

Please DO NOT ring me or leave a message on my phone.

Why have CSCI222?

What role does it fill in your CS studies?

What is this subject about?

- This subject provides a framework for **understanding and developing the necessary skills to successfully undertake the major third year software project**.
- The subject provides an introduction to the practical aspects of the development of a software application following a well defined process.
- Students will gain experience in the software development cycle, including requirements, design, and implementation, and also learn to exploit implementation support technologies.
- Assignments will provide experience of structured development work in a small group setting.
- The implementation language used in illustrations and assignments is C++.

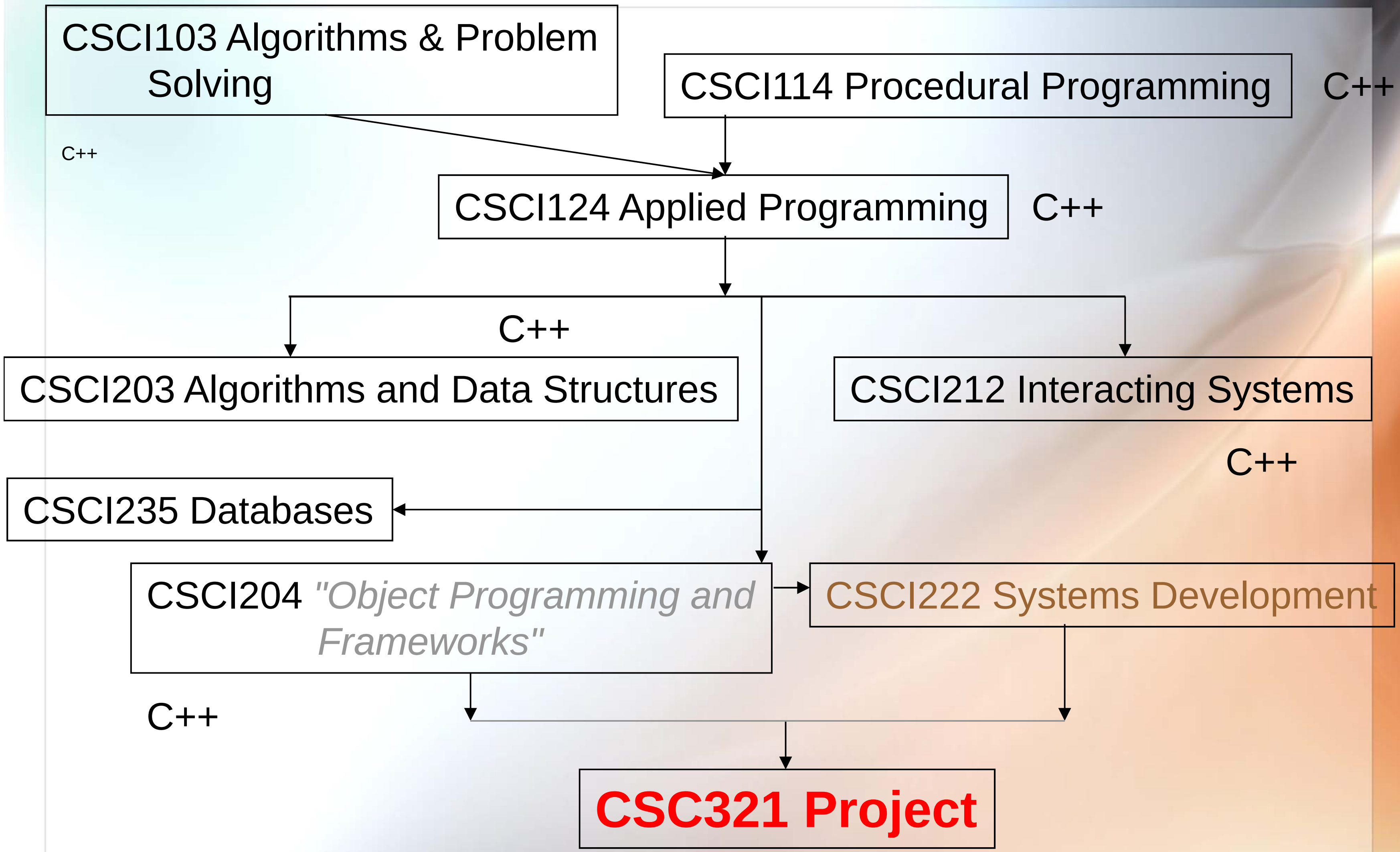
What are the objectives?

- On successful completion of this subject students will be able to:
  1. Design a software application of moderate size and complexity, making effective use of design tools.
  2. Use appropriate tools to develop and implement a software application of moderate complexity
  3. Create, plan, and implement a test plan for a software application.
  4. Work in a group following a defined software development process

Everything leads to CSCI321

- CSCI321 Project
  - "capstone" of the degree
  - Regarded as main demonstration of student ability in CS
  - Larger in scale than any previous development task
    - Requires planning
    - Requires development over a significant period of time
  - Involves group work
- Other core subjects provide the technical programming skills
  - **C++ from CSCI114, CSCI124, and CSCI204**
  - **Algorithms, Data structures from CSCI103, and CSCI203**
  - **Systems functions and processes from CSCI212**
  - **Database concepts from CSCI235**

Some of core CS subjects



CSCI103 Algorithms & Problem Solving

C++

CSCI114 Procedural Programming

C++

CSCI124 Applied Programming

C++

C++

CSCI203 Algorithms and Data Structures

CSCI212 Interacting Systems

C++

CSCI235 Databases

CSCI204 *"Object Programming and Frameworks"*

CSCI222 Systems Development

C++

CSC321 Project

CSCI222 contribution to CSCI321

- Group work
  - Occurs in other subject, but here gets some emphasis and quality of group work is assessable (not just resulting product)
- Process models
  - How to organize a development process that is longer than the 10-day deadline of a typical assignment
- Design models
  - Planning how to build an elaborate system, and documenting that plan
- Development tools and strategies
  - Maintaining a developing code base
- etc

Software Engineering in your degree

- Software Engineering provided via
  - Core subject:
    - CSCI222 Systems Development
  - Elective subjects:
    - CSCI205 Development Methods and Tools
    - CSCI311 Software Process Management
    - CSCI318 Software Engineering Practices and Principles

What is Software Engineering?

- Classical Engineering
  - Electronics & Electrical Engineering
  - Civil Engineering
  - Chemistry Engineering
  - Mechatronics Engineering

=> Software Engineering is

"the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, the application of engineering to software" (IEEE standard 610.12-1990).

Software Engineer is the best job in US in 2011

Source: http://www.braintrack.com/college-and-work-news/articles/software-engineer-ranked-best-job-for-2011-11010502

All students need some Software Engineering

- All students need to be able to "read" design models expressed in the Unified Modelling Language
  - Widely used (sometimes misused) in industry
  - As a junior employee, you won't be creating UML designs but you had better understand the designs for the project that you are working on.
- All students need to be familiar with the different development process models that are in common use
  - You had better not look blank if the recruitment interviewer asks you to characterise "agile methodologies"
- All students need an understanding of testing strategies employed in software developments – and be capable of testing their code.

Key topics

- SE development activities
- SE process models
- Software testing
  - CppUnit test
- Teamwork
- Version management
- UML modelling
- Rational Unified Process
- Requirements
- Software Architecture
- Distributed Systems
- User Interface Design

Books

- **Reference books:**
  - Software development for small teams: a RUP-centric approach, Gary Pollice et al.
    The rational unified process: an introduction, P. Kruchten
  - “Software Engineering” by Ian Sommerville
  - Unit Test Frameworks
    P. Hamill
  - Using UML: Software Engineering with Objects and Components, P. Stevens and R. Pooley
- **Some are e-resources**

Resources

- Lectures
  - PDF files with slides from lectures
- Assignments
- Supplementary materials

One-stop shop: eLearning

Overall Assessment

- Assessment
  - Exam 40%
  - A1 (group) 15%
  - A2 (group) 30%
  - Labs 15%
    - Some labs are assessable
    - Some labs are used for working on the assignments and “meeting the clients”.

Assessment – continuous assessment components

- Assignments are group projects
  - **Students are responsible for organizing themselves into groups of 4-5 people.**
  - Part of the assessment is based on measures of how well the group members worked together

Groups

- The groups for assignments should have 4-5 members each.
- *Formation of groups is your responsibility.*
- You will have to submit details of group membership (via email) by Friday, Week 2.
- It is strongly recommended all group members are in the same lab (but not necessarily).

A balanced group is a healthy group

- **Try to get a balanced group**
  - **“manager”**
  - **“chief programmer”**
  - **“tester”**
  - **“analysts and designers”**
- **Substantial part of mark for group assignments relates to process – you need to be organized and show that you are organized!**
- ***Groups that fail to be established on time start with a penalty mark!***

Assignment submission

- **Penalties apply to all late work, except if student academic consideration has been granted.**
- **Late submissions will attract a penalty of 15% of the assessment mark. This amount is per day including weekends.**
- **Work more than (4) days late will be awarded a mark of zero.**

Assignment submission

- Submitted in the lecture.
- One page group peer assessment document submitted in hard copy
  - **Specifies relative contributions of each member**
  - **Is signed by each member**
  - Original submitted in lecture period
  - Each group member has photocopy
  - ***The “relative contributions”, as agreed by all group members, determine any mark adjustments for those individuals whose contributions were less than average***

Individual contributions to group

- Use scheme similar to that which has been used in some 300-level SE subjects
  - Project assigned a mark
  - Individuals

• "contributed"	100% of group mark
• "limited contribution"	50% of group mark
• "almost no contribution"	10% of group mark
• "no contribution"	0% of group mark

  - If group agrees, they can assign different percentages – e.g. Tom, Dick, 100%, Sue 80%, Harry 5%

Sorry – but you can't get 200% of group mark just because your colleagues rated as "almost no contribution"!

Assignment return

- Markers write short note explaining your mark
- Marking scheme email-ed back to you

Public Service Announcements

Health and security issues

- I’m supposed to tell you that
  - If building on fire, earthquakes occurring, terrorists raiding, alien invasions from outer-space, …
  - Then leave building in orderly fashion and assemble outside.
  - See little map at theatre entrance for location of assembly area.
- You’ve been told

University of Wollongong

STANDARD FIRE ORDERS

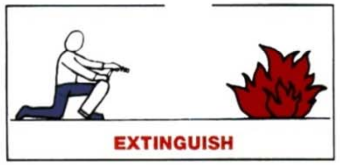
ACTIONS TO BE CONSIDERED ON DISCOVERING A FIRE

R "RESCUE" any person/s in immediate danger.

A "ALARM" Raise the alarm. Contact the Emergency Services on 0 000. Contact University Security on extension 4900. Activate Break Glass Alarm.

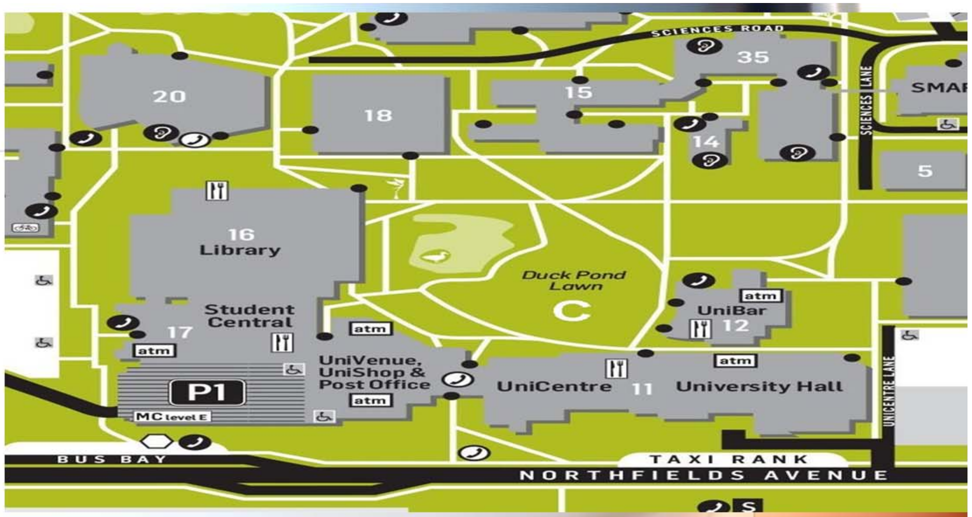
C "CONTAIN" Close doors to contain the fire.

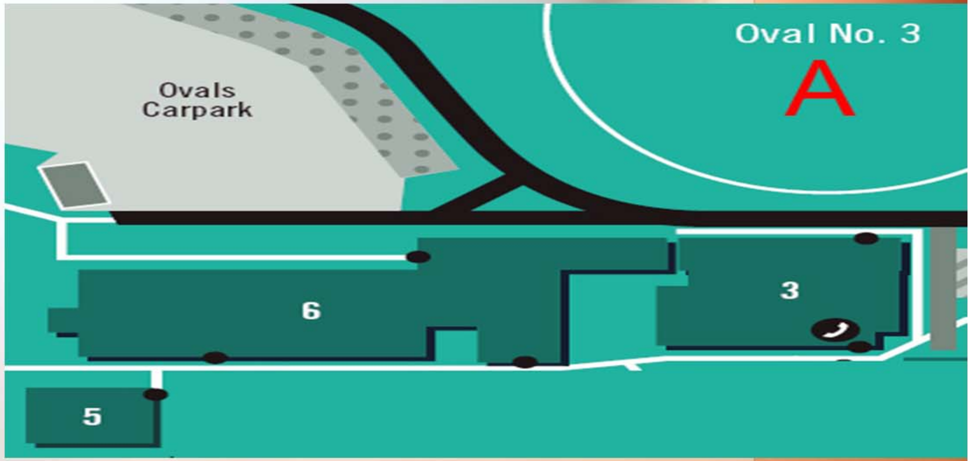
E "EXTINGUISH" Attempt to extinguish the fire only if you are trained and it is safe to do so.

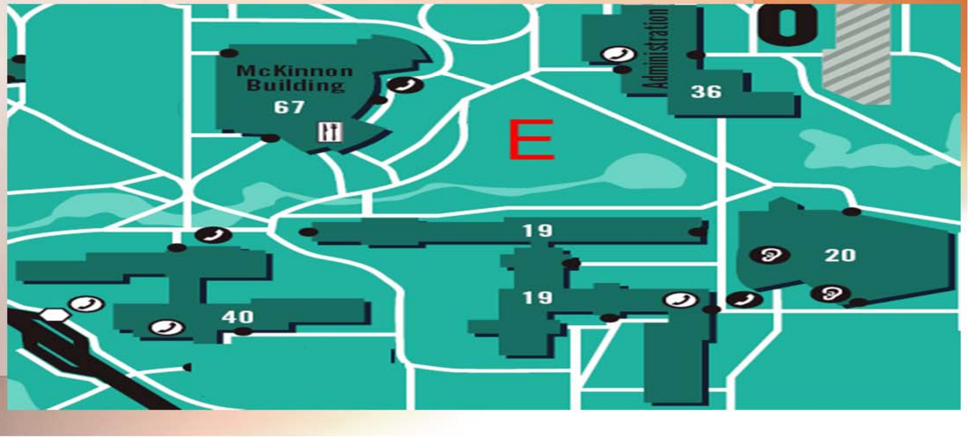


Follow the directions of Building Wardens.

My Building Warden is......................................







Q & A

- **Q: Can we obtain a HD in this subject?**
  - **A: "Yes, we can!"**
- **Q: Great! Sounds easy but how?**
  - **A: Sure, you need to do very well in the Lab (5%), the assignments (55%) and the exam (40%).**
- **Q: Of course, but still how?**
  - **A: Yes, you need to attend the lectures regularly** (very important in this subject), **read reference texts, and read Lecture slides.**
  - **You should also do Lab exercises**
- **Q: Hmmm, it's not that easy but it's ok, I can do it in just only 1 week before the exam, huh?**
  - **A: No, you have to do it every week.**
- **Q: Oh no, it's so difficult ☹. I don't want a HD anymore, I just want a P. So less work?**
  - **A: Yes, but you still have to do the same things.**

Any further questions?

- ?