Introduction to the Unit

ICT373: Software Architectures

Welcome

My Aims:

- Promote your interests in learning about Software Architectures
- Give you a hands on practical experience!

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How I plan to do this?

- Cover a range of topics
- Have labs covering theory and practical issues
- Two straightforward assessments
- One final exam!

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Unit Organisation and Assessment

Overview of the Unit

- This unit is about the concepts and processes involved with the larger-scale structure and organisation of software systems and how this is related to design and implementation.
- In keeping with the current interests in the computing industry and computer science research there will be significant sections on Object Oriented Analysis, Design, and Programming (in JAVA).
- To provide practical experience practical work will include designing, prototyping and implementing in an appropriate language.

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Aims/objectives of the Unit

- Understand the stages of the Software Development Life Cycle,
- Understand the various Architectures that can be used in software systems,
- Perform design for a system given a particular architecture,
- Develop a system using an object-oriented method and language,
- Develop a WWW-based client-server system.
- It looks at various current approaches to software design, e.g.:
  - Object-Oriented Design – a relatively new approach to software design
  - Client-server systems design – in particular for the World-Wide-Web, and
  - Examines architectures appropriate for these.

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Learning Outcomes of the Unit

On successful completion of the unit you should be able to:

1. Understand the stages of the Software Development Life Cycle
2. Understand the various Architectures that can be used in software systems
3. Perform design for a system given a particular architecture
4. Develop a system using an object-oriented method and language
5. Understand a WWW-based client-server system.

Graduate Attributes

This unit will contribute to the development of the following Graduate Attributes:

- Critical and creative thinking
- Selection of appropriate architecture for the SW
- Improved understanding of OO programming/Java
- In-depth knowledge of a field of study.

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Unit Coordinator

Professor **Ferdous Sohel**
School of Information Technology
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Unit Components

- This unit has the following components:
- A lecture each week covering a foundational area of Software Architectures
- Weekly workshops/labs
- Two Assignments
- Exam

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Time Commitment

- Lecture: 2 hours each week
- Laboratory session: 1 hour per week (lab starts in Week 2).
- As this is a **3**-credit point unit, we expect you to spend on average **10** hours per week for the total weeks of this teaching period (or **150** hours overall) working on this unit.
- Students are encouraged to attend the lectures and the workshops
- Students studying off-campus are also welcome to attend lectures and workshops, subject to availability of spaces.

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Pre-requisites

- ICT104 Principles of Computer Science OR ICT167 Principles of Computer Science;
- Software Architectures will assume familiarity with systems analysis and good programming skills (in C++ or Java).
- If you are in doubt about your qualifications or background preparation, you should get in touch with the Unit Coordinator as soon as possible.

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Assessments

Same for both Internal and External Students. All are individual assessments.

No.	Assessment Name	Unit Learning Outcomes	Accreditation Standards	Weight %	Individual / Group	Due Date and Time
1	Assignment 1	Software Architecture Design: Object Orientation Programming	3, 4, 5	25%	Individual	Session 6
2	Assignment 2	Software Architecture Design: Object Orientation Programming and GUI	3, 4, 5	25%	Individual	Week 11
3	Final Examination	All	1 - 5	50%	Individual	University assessment period

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Assignment Submission

Assignment submission

- Assignments 1 and 2 are **individual assignments**. They must be submitted electronically using LMS within the appropriate deadline. Refer to the instructions for each of the assignments.
- **Late submissions** will attract a **penalty of 10%** of the marks available for the assignment per day or part thereof.

Extensions

- In cases where illness or other circumstances make it difficult or impossible to submit an assignment by the due date, you should **contact the Local Teacher/Unit Coordinator immediately.** You should state the reason why you think an extension should be granted. The Unit Coordinator will decide if an extension should apply, and if so, the duration of the extension.

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Dishonesty in Assessment (1/2)

- The University regards most seriously any acts of dishonesty relating to assessment.
- All submitted work must be your own.
- Keep a copy of all of your submitted material.
- Assessment for this unit is in accordance with the provisions of Degree regulations 40–48. Check these in the current *Murdoch University Handbook.*
- More on the unit learning and information guide.

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Dishonesty in Assessment (2/2)

- And "How to avoid plagiarism" available at:
- http://our.murdoch.edu.au/Student-life/Study-successfully/Referencing-and-citing/How-to-avoid-plagiarism/
- For further information on **Important Deadlines**, visit
- http://handbook.murdoch.edu.au/dates/teaching_periods

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Examination

- For ICT373, there is a **three (3) hour** exam. It is a paper based on campus exam. The exam questions consist of questions on any of the material in the unit. The examination is worth **50%** of the overall unit mark.
- Don’t worry about this now. We will tell you what you need to revise in the last lecture.

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Final Grade

Notation	Grade	Percentage Range
HD	High Distinction	80 – 100%
D	Distinction	70 – 79%
C	Credit	60 – 69%
P	Pass	50 – 59%
N	Fail	Below 50%
SA	Supplementary Assessment	45 – 49%*
SX	Supplementary Exam	45 – 49%*

*The award of the grade of SA/SX shall be at the discretion of the Unit Coordinator.

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Resources for the Unit

- All the unit materials and resources are available on LMS and can be accessed from your MyUnits page at: http://www.murdoch.edu.au/students/myunits/
- The unit materials will be added progressively during the semester. Please check this site regularly.
- Lectures.
- Worksheet for each lab.
- Sample exams (from previous years).

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Learning materials for ICT373

- Unit information Guide.
- Lecture notes, example programs and extra material available from your ICT373 MyUnits page
- Main text: **Deitel, P. and Deitel H., *Java How to Program Early Objects,* 11th Edition, Pearson Education 2017.**
- Software (all available on the School's PCs)browser (Mozilla Firefox >=33.0 or Internet Explorer >=10.0)
- **Java JDKFX**
- **An IDE** - NetBeans IDE
- Other references (see Unit Information Guide)

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What to do?

- download the unit information guide or read it online
- sign up for a lab using Myinfo (internal students only)
- buy the textbook
- do weekly reading of lecture slides (online) + book
- attend lectures
- attend labs and do the weekly practice exercises
- do the two assignments on time
- sit the exam.

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Study Schedule

Session No.	Topic No.	Topic Title	Text Book Chapter(s) - 11th Ed	Assessment Due
1	1	Introduction to Software Architecture		
2	2	Client-Server Architecture and the World-Wide-Web		
3	3	Objects and the Java Language	1 – 8	
4	4	Composition and Inheritance, Reuse, Collections	9, 10, 11, 14, 16, 20	
5	4	Composition and Inheritance, Reuse, Collections (continued…)	9, 10, 11, 14, 16, 20	
6	5	Streams and Persistence	15, 17	Assignment 1 due
7	6	Graphical User Interfaces, Events and FSMs	12, 13, 22	
8	6	Graphical User Interfaces, Events and FSMs (continued…)	12, 13, 22	
9	7	Multithreading - Processes, Threads and Synchronization	23	
10	8	Network Programming, Client-Server systems and the Web	28 (Textbook website)	
11	9	Design Patterns and other Software Architectures	Appendix N (Textbook website)	Assignment 2 due
12		Design Patterns and other Software Architectures (continued…) and Unit Review		

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Each Week

- We will give a theory lecture – max 2 hours
- We will try to summarise as much as possible
- You must read the required textbook chapter
- Go to the workshop/LAB

- Complete the assignments in time

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