Software Reuse Technologies

Dr. Shiping Chen
shipingchen2005@gmail.com

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Who am I?

- A research scientist from CSIRO ICT Centre www.ict.csiro.au
- An IT veteran with over 20 years R&D experiences and combined knowledge/skills in science and engineering:
  - B.Eng. M.Eng. & PhD in Computer Science
  - Research vs. Development in Industry
- Interested in solving real problems with existing and novel technologies
- My research interest is distributed systems, esp. on performance, security and privacy, and cloud computing
- If you are interested in my research, please Google "Shiping Chen"
- For any course-related enquires: shipingchen2005@gmail.com
- If you want to do Master/PhD in Australia, please email me on shiping.chen@csiro.au

Today's Agenda

- Introduction to this course:
  - Prerequisites
  - Learning objectives
  - Course outline
  - Assessment package
  - Assignment & exam

- Module 1
- Module 2

Introduction to This Course

- This course is about *Software Reuse (SR) Technology*, especially focus on:
  - Design patterns reuse
  - Object reuse
  - Component reuse
  - Service reuse

- But also covers:
  - Requirement reuse
  - Software testing reuse
  - Software reuse management

Prerequisites

- Assumed knowledge:
  - OO programming: e.g., Java and C#
  - UML modelling basics: e.g., Use-case, class diagram, sequence-diagram...
  - Database basics: e.g., SQL, JDBC etc.
- Your presence on site:
  - Required for all lectures and assignment presentation
- Your offline consultations:
  - You are welcome to ask questions about this course offline, such as before/after classes

Learning Objectives vs. Marks

Levels	Objectives	Explanations
Distinction	CTO Architect PM/TL	++ Have in-depth SR knowledge in whole SDLC ++ Master the key technologies of enabling and managing SR ++ Be able to apply the SR principles and tools in designing and managing reusable software
Credit	Senior Software Engineer	+ Master the knowledge and technologies of SR + Know and understand common design patterns + Can apply them in building reusable software
Pass	Developer Programmer	• Attend the lectures • Understand the basic concepts of SR • Demonstrate your reasonable understanding in doing the assignment and the final exam
Fail	N/A	- Did not attend the lectures - Did not complete the assignment - Failed in the final exam

Module 1. Introduction to SR

- What is software reuse?
- Why software reuse?
- Successful stories about software reuse
- A taxonomy of software reuse

Module 2. Requirement Reuse

- Overview of SDLC
- What are the challenges in software requirement analysis?
- How software reuse can help?

Module 3. Design Pattern Reuse

- Overview of Software Architecture
- Design patterns for reuse
- Some common design patterns
  - Layering for networking communication
  - MVC for web applications
  - Pub/Sub for messaging
  - …

Module 4. Reuse in Development

- Procedures Reuse
- Classes(Object) Ruse
- System Calls Reuse
- Component Technologies for reuse
  - COBRA
  - EJB
  - COM+
- Web services technologies for reuse
  - Web Services
  - Web Services Security

Module 5. Testing Reuse

- Overview of Software Testing
- Why Reusing testing technologies?
- Unit Testing Technologies for reuse
- Performance Testing Technologies for reuse

Module 6. Reuse Technologies in Software Packaging, Deployment and Documenting

- Reuse technologies in software packaging
  - Make
  - Ant
  - Maven
  - …
- Reuse technologies in writing software documentation

Module 7. Software Reuse Management

- Software Reuse measurement
- Processes changes need for software reuse
- Organizations changes needed for software reuse
- Reusable software assets
- Reuse repository

One Assignment

- A set of tasks will be given as the class is going
- Each team/individual is required to give a 15 minutes presentation to report the completion of these tasks at end;
- This will be worth 40% marks;
- The mark will be given to all team members if they are in the same team and there are no big issues for team work
- **Some parts of the final exam will be from the assignment**;

Final Exam

- It is a 2 hours, and
- Close papers exam;
- Which is worthy 60% marks for your final marks

Schedule – Student Consultation

In multiple ways:

- In person:
  - Place: In the lecture room
  - Time/Date: before/after lectures
- By Email:
  - ALL students use the same course email:
  - shipingchen2005@gmail.com

Assessment Mothod

- **Assessment:**
  - Assignment: 40% of the final result
  - Final Exam: 60% of the final result
- **Pass threshold:**
  - Final Marks: 60% of 100, i.e. >=60 marks
- **Levels:**
  - HD (High Distinction).....95% up marks
  - Distinction.....90% up
  - Credit.....70% up
  - Pass .....60% up
  - Failed .....59% blow

Any Questions?