ENGINEERING

SOFTENG 325

Software Architecture

Andrew Meads

Agenda

- Intro to SOFTENG 325
- What are distributed systems?
- Basic networking – TCP with Java
- Java serialization

THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

ENGINEERING

SOFTENG 325 – Software Architecture

Course Outline

Course team

- Lecturers
  - Weeks 01 – 07: Andrew Meads (course coordinator)
  - Weeks 08 – 12: Mohammad Ghafari (remote)
- Tutor
  - Qiming Bao
- Course director
  - Ewan Tempero

Course delivery and contact times

For the **first half** (weeks one - six):

- **Videos:** The material for each lecture will be covered in video presentations, which will be posted to Canvas at minimum the weekend before the corresponding tutorial, and ideally a week before whenever possible. **It is expected that students come to the tutorials having already watched the associated videos.**
- **Discussion & tutorial: Tuesdays, 10am - 12pm, ClockT039 / 105S-039.** These sessions will be an opportunity to ask any questions you might have about the videos and lab material. There will also often be questions to discuss, of the form one might expect in tests, and can be a further opportunity to work on the lab material together. **Note:** although they are scheduled, there will be *no 8am Monday lectures for the first half* unless otherwise notified.
- **Labs: Thursdays 4pm - 6pm and Fridays 3pm - 5pm,** 405-522. These sessions provide you with lab space to work on the lab exercises. The tutor and / or lecturer will often be present to answer any questions you may have.

For the **second half** (weeks seven - twelve): TBC, will be online delivery of some sort as Mohammad is currently overseas due to travel restrictions.

Learning outcomes (part one)

On successfully completing this course, you will be able to:

- Describe what is meant by software architecture and describe its reason for existence in the software life-cycle
- Describe the role of middleware and application frameworks in developing modern distributed information systems
- Describe key challenges in developing distributed information systems and explain established techniques to address these
- Develop a simple Web application using appropriate tools, including Web service and ORM frameworks

Learning outcomes (part two)

On successfully completing this course, you will be able to:

- Explain what quality attributes are and how they can be specified through both general and concrete scenarios
- Describe the relationship between quality attributes of a system, software architecture patterns, and tactics for developing software architectures, and give common examples of patterns and tactics
- Describe properties of well-designed subsystems in an architecture

Software

For part one of this course, a development environment supporting **git** and **Maven** projects is required. The best choices are:

- IntelliJ IDEA Ultimate edition: In the lecturer's opinion, this is the best choice for an IDE for this course. The Ultimate edition is available for free for educational purposes, if you sign up with your University email address. **Note: Only the Ultimate edition works**. The community edition does *not* support the correct project types.
- Eclipse: Also a functional editor supporting the necessary project types. I would recommend trying IntelliJ first, unless you're already really familiar with Eclipse and don't want to change IDEs for this course.
- Both IDEs are available on the University lab machines.
- It is also highly recommended to run the software in a **Windows** environment - you may not be able to receive support from lecturers / tutors when encountering strange errors on other platforms.

Course structure & prerequisites

Topics (part 1)

- Web services
  - Networking
  - Distributed objects
  - Web services
- Object-relational mapping (ORM)
  - ORM with JPA
  - Transactions
- Middleware

Prerequisite knowledge

- Good working knowledge of Java
  - SE 251, SE 254
- Fundamental knowledge of relational databases
  - SE 351

Assessments

Name	Type	Weighting	Due date
Assignment 01	Practical	20%	September 27th
Assignment 02	Written	10%	November 1st
Test 01	Restricted book	9%	September 22nd
Test 02	Restricted book	6%	October 27th
Exam	Restricted book	55%	TBC

Workload

- 2 “lectures” per week
  - Thursday 8-10am (105S-039)
  - Friday 9-11am (201N-352)
- 2 hour lab per week
  - For first part of course only
  - Supervised practical sessions
- See course description PDF document, available on Canvas
- Suggested study skills include:
  - Use the lab sessions; maintain a journal
  - Read beyond lecture materials – they don’t contain all the information for the course
  - Experiment and write code
  - Participate on Piazza
- 5 hours of independent and directed study each week is assumed