

Course Overview

Software Architecture

Richard Thomas

February 24, 2025

University of Queensland



What is the course about?

- Well, *software architecture*.

What is the course about?

- Well, *software architecture*.
- Designing and building software systems.

What is the course about?

- Well, *software architecture*.
- Designing and building software systems.
 - Multiple *software components* that work together.

What is the course about?

- Well, *software architecture*.
- Designing and building software systems.
 - Multiple *software components* that work together.
- Using *architecture patterns* to structure software systems to be *maintainable*.

What is the course about?

- Well, *software architecture*.
- Designing and building software systems.
 - Multiple *software components* that work together.
- Using *architecture patterns* to structure software systems to be *maintainable*.
- How to build software that is *reliable* and *fault tolerant*.

What is the course about?

- Well, *software architecture*.
- Designing and building software systems.
 - Multiple *software components* that work together.
- Using *architecture patterns* to structure software systems to be *maintainable*.
- How to build software that is *reliable* and *fault tolerant*.
- How to build software that is *scalable*.

What will we be doing?

Lectures

- Learn common *architecture patterns*.

Case Studies

Practicals

What will we be doing?

Lectures

- Learn common *architecture patterns*.
- Learn tools and techniques for *designing* and *implementing* software systems.

Case Studies

Practicals

What will we be doing?

Lectures

- Learn common *architecture patterns*.
- Learn tools and techniques for *designing* and *implementing* software systems.
- Learn the principles for working with *distributed systems*.

Case Studies

Practicals

What will we be doing?

Lectures

- Learn common *architecture patterns*.
- Learn tools and techniques for *designing* and *implementing* software systems.
- Learn the principles for working with *distributed systems*.

Case Studies

- Work on *case studies* that implement architectural patterns.

Practicals

What will we be doing?

Lectures

- Learn common *architecture patterns*.
- Learn tools and techniques for *designing* and *implementing* software systems.
- Learn the principles for working with *distributed systems*.

Case Studies

- Work on *case studies* that implement architectural patterns.
- Hands-on practice with the tools and techniques for *designing* and *implementing* software systems.

Practicals

What will we be doing?

Lectures

- Learn common *architecture patterns*.
- Learn tools and techniques for *designing* and *implementing* software systems.
- Learn the principles for working with *distributed systems*.

Case Studies

- Work on *case studies* that implement architectural patterns.
- Hands-on practice with the tools and techniques for *designing* and *implementing* software systems.

Practicals

- Develop stateless and persistent *RESTful web APIs*.

What will we be doing?

Lectures

- Learn common *architecture patterns*.
- Learn tools and techniques for *designing* and *implementing* software systems.
- Learn the principles for working with *distributed systems*.

Case Studies

- Work on *case studies* that implement architectural patterns.
- Hands-on practice with the tools and techniques for *designing* and *implementing* software systems.

Practicals

- Develop stateless and persistent *RESTful web APIs*.
- Package software components into *Docker* containers.

What will we be doing?

Lectures

- Learn common *architecture patterns*.
- Learn tools and techniques for *designing* and *implementing* software systems.
- Learn the principles for working with *distributed systems*.

Case Studies

- Work on *case studies* that implement architectural patterns.
- Hands-on practice with the tools and techniques for *designing* and *implementing* software systems.

Practicals

- Develop stateless and persistent *RESTful web APIs*.
- Package software components into *Docker* containers.
- Deploy containers to cloud platforms using *Terraform*.

What will we be doing?

Lectures

- Learn common *architecture patterns*.
- Learn tools and techniques for *designing* and *implementing* software systems.
- Learn the principles for working with *distributed systems*.

Case Studies

- Work on *case studies* that implement architectural patterns.
- Hands-on practice with the tools and techniques for *designing* and *implementing* software systems.

Practicals

- Develop stateless and persistent *RESTful web APIs*.
- Package software components into *Docker* containers.
- Deploy containers to cloud platforms using *Terraform*.
- Use cloud platform tools to *monitor* and *scale* applications.

§ Assessment

Assessment

Project Proposal 5%

Cloud Infrastructure Assignment 35%

 API Functionality 12%

 Deployed to Cloud 10%

 Scalable Application 13%

Architecture Presentation 25%

Capstone Project 35%

(Delivering Quality Attributes Project)

Building a Scalable Architecture

1. Build a *RESTful web API* according to our specification.
2. *Test* that the API satisfies the specification.
3. *Deploy* the API to a cloud platform.
4. *Scale* the API to handle *high loads*.

Capstone Project

1. *Propose* a *software system* that you would like to build.
2. Vote on other proposals on which you would like to work.
3. Teams will be assigned to work on selected projects.
4. *Design* and *implement* the project.

Architecture Presentation

- Team presents details of project architecture.
 - *Everyone* presents.
- *Individuals* present on different sets of questions.
 - Compare and contrast with another architectural pattern.
 - Pros and cons of architecture.
 - Implementation characteristics of design.
 - Potential security risks of architecture.
- *Everyone* is expected to understand entire architecture.
 - Questions can be directed to *anyone*.

§ You and Us

Who are we?



Richard Thomas



Guangdong Bai



Vy Ho



Zaidul Alam



Thuy Dao



Nimesh Garg

Question

Who are *you*?

Course Website

All course material is hosted on the course website:

<https://csse6400.uqcloud.net>

If you find any *errors* or have any *improvements*, please submit a pull request on GitHub:

<https://github.com/CSSE6400/software-architecture>

GitHub Username Registration Form: 4pm on Feb. 24¹

You need access to the CSSE6400 organisation on GitHub.

- *Practicals* – Access to code
- *Assessment* – Most submissions



<https://tiny.cc/csse6400reg>

¹Yes, that is *today*.