

Course Overview

Software Architecture

Richard Thomas

February 19, 2024

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.

\S *Assessment*

Assessment

| | |
|----------------------------------|-------|
| Project Proposal | 5% |
| Building a Scalable Architecture | 30% |
| API Functionality | 12% |
| Deployed to Cloud | 7.5% |
| Scalable Application | 10.5% |
| Presenting an Architecture | 30% |
| Capstone Project | 35% |

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*.

Presenting an Architecture

1. Find an active *open-source* project that *interests you*.
 - From a list of suggested projects.
2. *Discuss* the project with course staff.
3. Dive into the code and *understand* the architecture.
4. *Present* a summary of the architecture to the class.

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.

§ You and Us

Who are we?



Richard Thomas



Evan Hughes



Riza Wibawa



Zaidul Alam

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

You need access to the CSSE6400 organisation on GitHub.

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



<https://tiny.cc/csse6400reg>