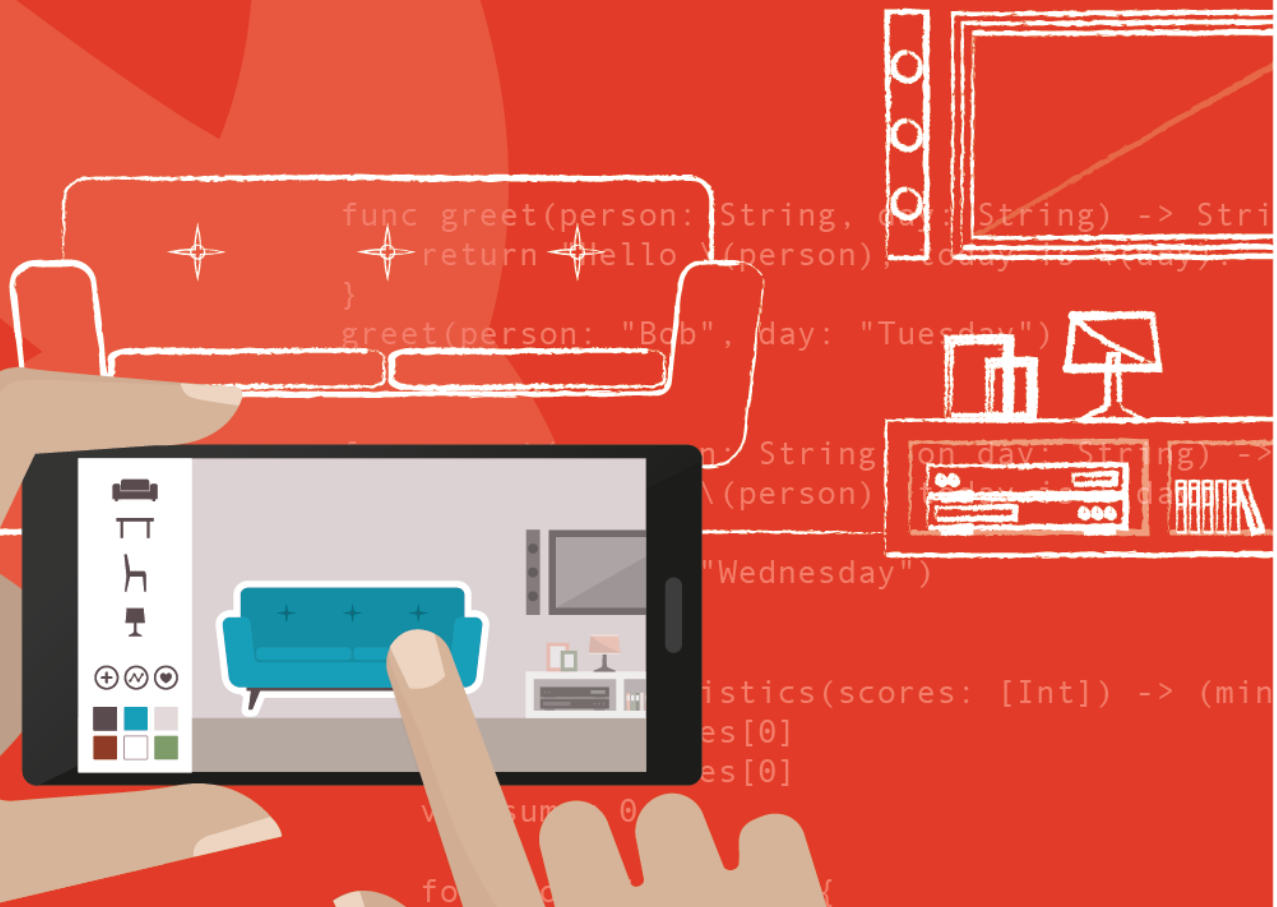Curtin University

# WORK WITH AUGMENTED REALITY (AR) AND THE WEB (APP2x)

**COURSE SYLLABUS**

# APP2x – Work with Augmented Reality (AR) and the web

## Course Description:

In this course you will learn how to build AR apps with Xcode and look at the different ways to integrate web content into your iOS apps.

## Course Objectives:

After completing this course, you will be able to:

- Use ARKit to create augmented reality scenes and objects for your apps
- Test and debug your AR app
- Connect to web services to fetch or send info to and from your app

## Pre-Requisites:

Xcode 12 or later running on a compatible macOS computer.

## Time Commitment:

8-10 hours per week.

## Your Instructors:

### Dr David McMeekin

David has a PhD in Software Engineering looking at the human aspect of software development: how software developers think.

David has spent extensive time in the International community working with and directing NGOs as well as within the education sector.

David has a vast array of lecturing experience in various areas since 1994, from Cross Cultural Communication, Software Engineering Tools and Metrics, Software Development, Programming in C, Java and Python, Business Information Systems, through to Spatial Data Processing and Computation.

David's current research interests include the delivery of spatial information through the use of semantic web technologies as well as the development of software quality assurance as a career path for people with Aspergers.

## Tristan Reed

Specialising not only in the development of web and mobile applications, Tristan is also highly experienced in the training of the skills and techniques of software development. With over a decade of experience in software development, Tristan is highly skilled in the design and development of solutions to difficult problems requiring integration with a wide range of systems.

Tristan is a determined and enthusiastic development experienced in a wide range of modern technologies for front-end and back end development, including but not limited to HTML5/CSS, Cocoa/Objective-C, Django/Python, PHP, C#, Android/Java, jQuery and most flavours of SQL. Tristan is also experienced with software project management, using the Agile process to quickly deliver results for clients and make the most of often scarce resources.

## Course Syllabus:

This course consists of eight lessons. We estimate that you will need to spend at least 8-10 hours per week on each lesson.

### Lesson 1: User Interaction and Saving Data

- Write and access files within Apps;
- Serialise a data model for saving and loading data from and into Apps;
- Customise tables for adding, deleting and customising actions;
- Create custom row actions.

### Lesson 2: System controllers in Apps and User Input

- Displaying alerts, sharing content and sending messages from within Apps;
- Access to the camera and photo library on the device;
- Build custom forms for creating new object models;
- Get complex user input through forms, data collection and dynamic table views.

### Lesson 3: Construct an AR App

- Learn how to use the AR app template;
- Investigate AR components and compare their differences with existing components;
- Build AR scenes in 3D space using objects;
- Determine planes and how objects interact with them.

## Lesson 4: Interact with an AR App

- Add physics to an AR scene;
- Translation of user input within the scene;
- Introduction to AR Image Recognition.

## Lesson 5: Closures and Animation

- Define and use closures;
- Use defined functions: sort, filter, reduce and map;
- Utilise animation for a greater user experience;
- Use UIKit to create animations.

## Lesson 6: Communicate with the Web

- Describe requests and responses, and discover how are they built, used and analysed;
- Communicate with APIs for existing data sources;
- Use URL components to dynamically query an API endpoint.

## Lesson 7: An Introduction to JSON

- What is JavaScript Object Notation (JSON) and how is it useful?
- Decode JSON and convert into Swift types;
- Integrate with requests and responses from APIs.

## Lesson 8: Concurrency

- Why do we care about concurrency?
- Issues with multi-threading and the UI;
- How to complete tasks asynchronously.

## Assessment Summary:

In order to successfully complete this course you must gain an overall mark of **70% or higher**.

This course consists of four assessments, as outlined below. You can find further details about assessment requirements within the Assessment section of the course.

| Assessment Type | % of Final Grade | Due Date |
|---|---|---|
| Lesson 1 Quiz | 10% | Before course ends |
| Lesson 2 Quiz | 10% | Before course ends |
| Lesson 3 Quiz | 10% | Before course ends |
| Lesson 4 Quiz | 10% | Before course ends |
| Lesson 5 Quiz | 15% | Before course ends |
| Lesson 6 Quiz | 15% | Before course ends |
| Lesson 7 Quiz | 15% | Before course ends |
| Lesson 8 Quiz | 15% | Before course ends |

Further details about the assessments are provided within the course.

## Course Schedule:

| Week | Module | Topic | Assessment |
|---|---|---|---|
| 1 | Orientation + Lesson 1 | Welcome to the course + User interaction and saving data | Lesson 1 Quiz |
| 2 | Lesson 2 | System controllers in Apps and User Input | Lesson 2 Quiz |
| 3 | Lesson 3 | Construct an AR App | Lesson 3 Quiz |
| 4 | Lesson 4 | Interact with an AR App | Lesson 4 Quiz |
| 5 | Lesson 5 | Closures and Animation | Lesson 5 Quiz |
| 6 | Lesson 6 | Communicate with the Web | Lesson 6 Quiz |
| 7 | Lesson 7 | An Introduction to JSON | Lesson 7 Quiz |
| 8 | Lesson 8 | Concurrency | Lesson 8 Quiz |