

# **Solent University**

## **in Partnership with QA (QAHE)**

**Unit Code:** QH0540

**Unit title:** Web Application Development

### **Why is this unit important?**

From classic websites to back-ends for mobile apps, the web is all-pervasive these days, and thus web development skills are in high demand. Increasingly the architecture of the web involves web APIs (application programming interfaces) which supply pure data to be used by client software, which can be browser-based (HTML and CSS) web front ends, mobile apps or desktop applications. In this unit you will learn how to develop web APIs and web-based clients making use of the data they provide.

### **What you will learn on this unit**

We will begin with a look at how to develop web APIs making use of common architectural patterns (such as REST) and server-side frameworks which make it easy to develop APIs which follow these patterns. We will also look at data formats (such as JSON) which are used to exchange data between client and server. Later we will consider how standards-compliant HTML-based web pages can send requests to web APIs in the background (allowing the user to continue to interact with the page) and make use of the data returned. We will consider security aspects of web applications and will also consider how complex front-ends can be built using a browser-based scripting language such as JavaScript. We will also look at location-based applications and web maps as a visual and engaging way to illustrate the concepts learnt in the unit. The unit will also provide a taste of selected recent developments in the field.

### **How you will learn**

The unit will consist of lab-based practical sessions which will allow you to gain hands-on experience of the unit topics through a series of lab exercises. In most weeks, these will be preceded by a 'mini-lecture' to introduce the unit topic and to ensure that you are aware of the background to the topic before beginning the practical exercise. During the lab sessions, we will be on-hand to help you with problems.

### **How much time the unit requires**

This unit is a 20-credit unit. For a 20-credit unit, you are expected to study for 200 hours (which equates to 10 hours per credit). This total learning time is made up of contact time, directed learning tasks, independent study and assessment activity. Your tutor will offer you guidance on how you should best manage your study time on this unit,

### **How you will be assessed**

#### **Tasks which help you learn and prepare you for summative tasks (formative):**

1. Each week you will perform practical exercises on the current topic. These practical exercises will allow you to gain practical experience of web development. The summative practical exercise (Assessment 1) will assess the same topics as the weekly lab tasks and thus by completing the lab tasks, with assistance from the tutor when needed, you will be well prepared to carry out the summative assignment successfully.
2. In preparation for the TCA (Assessment 2) you will sit a mock TCA shortly before. Following the mock TCA, we will go over the answers to help you understand your mistakes, which you can then take on board for the real TCA.

**Tasks which count towards your degree (summative):**

There will be two summative assessments:

1. A practical assignment to build a web application with a rich and interactive front-end and web API-based back-end. As well as building the application, you will be asked to document how you used the unit's topics to design and build it, and how you secured your code to prevent common vulnerabilities.
2. A time-constrained assessment. This will take the form of a partly-developed simple web API and front-end, with missing code. In a time limit of two hours, you will be asked to complete the application (by means of clearly-defined questions) and get it working. Early TCA questions will be simpler and later ones more demanding and require more thought.

**When assessment does not go to plan:**

Subject to receiving constructive feedback, for the practical assignment, you will be asked to complete a modified version of the original assessment, with slightly different requirements, during the referral period.

For the TCA, you will be asked to sit a new TCA in the referral period.

**What you will be able to do after the unit:**

1. Build web APIs providing pure data to client applications making use of a server-side framework and incorporate this data into a browser-based application written in a client-side scripting language.
2. Evaluate and make use of an industry-standard web API architecture
3. Write secure code which considers common contemporary security threats to web applications.
4. Ensure that the application conforms to the key legal, ethical and privacy issues surrounding web applications.
5. Appraise and test the accessibility compliance of web applications.

**How this relates to the dimensions of Solent's Real-world curriculum framework**

Dimensions	How will students learn	How will students be assessed
Students are challenged to think in critical, creative and applied ways	Learning the unit material will allow them to apply it to an interesting and engaging scenario.	The software development assignment will assess students' ability to apply the unit topics to the scenario. Students will be able to use their creativity in implementing additional features or using well-designed, efficient code
Students experience an intellectually stimulating curriculum which inspires them to learn for life	The unit material will cover concepts which are new and intellectually challenging to the students.	By application of those concepts in the software development assessment and the TCA
Students learn from authentic, engaging and programmatic assessment	The scenario will involve building an interesting and engaging API-driven web application and one potentially useful in the real world	By successful completion of the software development assessment

## Summative assessment details

AE1	Weighting:	50%
	Assessment type:	Software Development Application with Report
	Aggregation:	Aggregated to AE2
	Length/duration:	2000 words for accompanying report
	Online submission:	Yes
	Grade marking:	Yes
	Anonymous marking:	No

AE2	Weighting:	50%
	Assessment type:	Time Constrained Assignment
	Aggregation:	Aggregated to AE1
	Length/duration:	2 hours
	Online submission:	Yes
	Grade marking:	Yes
	Anonymous marking:	Yes

## Indicative Reading List

Mitchell, L.J (2016) *PHP Web Services: APIs for the Modern Web* (2<sup>nd</sup> edition), O'Reilly Media.

Sturgeon, P. (2015) *Build APIs You Won't Hate: Everyone and their dog wants an API, so you should probably learn how to build them* (1<sup>st</sup> edition)

Welling, L. and Thomson. L, (2016) *PHP and MySQL Web Development (Developer's Library)*, 5<sup>th</sup> edition, Addison-Wesley.

Zakas, N. (2016) *Understanding ECMAScript 6: The Definitive Guide for JavaScript Developers*, No Starch Press.