

## University of the West of Scotland

## Module Descriptor

Session: 2024/2025

<b>Title of Module: Modern Web Development</b>			
<b>Code: COMP10XXX</b>	<b>SCQF Level: 10 (Scottish Credit and Qualifications Framework)</b>	<b>Credit Points: 20</b>	<b>ECTS: 10 (European Credit Transfer Scheme)</b>
<b>School:</b>	School of Computing, Engineering and Physical Sciences		
<b>Module Co-ordinator:</b>	TBC		
<b>Summary of Module</b>			
<p>Proficiency in developing across all levels of a modern web stack is essential for many software professionals, not just limited to web developers. This module provides students with an opportunity to develop and test web applications using modern full-stack development methodologies. While understanding the basics of specifying structure (HTML), presentation (CSS), and behaviour (JavaScript) is fundamental, it represents only a fraction of what makes up modern web applications.</p> <p>Guided by developments in the field and current market demands, this module is designed to familiarise students with the latest tools, technologies, and frameworks crucial for developing scalable, reliable, and fast web applications. It will touch upon the entire development process, from integrating databases to building user interfaces and selecting a suitable deployment strategy, preparing students for real-world scenarios.</p> <p>As of the latest version of this descriptor, the module will focus on the MERN stack consisting of MongoDB, Express.js, React, and Node.js</p> <p>The detailed syllabus will be based on the technologies used, but common themes that are being covered will include:</p> <ul style="list-style-type: none"> <li>• Web Stacks (MERN, LAMP, MEVN, Serverless) and a comparison thereof.</li> <li>• Architectural Styles and Frameworks: n-tier architectures and common web design patterns (e.g. MVC, MVVM).</li> <li>• Server-side development: Implementation of server-side logic based on the selected stack, working with databases as well as scalability and performance considerations.</li> <li>• Front End Development: Implementation of responsive and reactive user interfaces using front-end frameworks and libraries.</li> <li>• Application Programming Interfaces (APIs): Design, implementation and consumption of APIs in client/server-side applications as well as REST and GraphQL principles</li> </ul>			

- Development and Deployment Practices including selecting hosting options and platforms, monitoring and logging as well as testing (end-to-end and unit) of web apps.
- Security Practices including authentication and authorization mechanisms, OWASP Top Ten vulnerabilities and mitigation strategies and secure authentication methods and session management techniques.
- Emerging Trends such as Progressive web applications (PWAs) and their benefits, Integration of AI and machine learning in web applications and an exploration of the future of web development and industry trends

This module will work to develop a number of the key 'I am UWS' Graduate Attributes to make those who complete this module:

- Universal: analytical; critical thinker; and collaborative
- Work Ready: problem-solver; digitally literate; knowledgeable
- Successful: autonomous; resilient; and transformational

Module Delivery Method					
Face-To-Face	Blended	Fully Online	HybridC	Hybrid 0	Work-Based Learning
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><i>If this module is delivered within the BSc (Hons) IT Software Development Programme the 'Blended' module delivery method applies.</i></p> <p><b>See Guidance Note for details.</b></p>					

Campus(es) for Module Delivery						
The module will <b>normally</b> be offered on the following campuses / or by Distance/Online Learning: (Provided viable student numbers permit) (tick as appropriate)						
Paisley:	Ayr:	Dumfries:	Lanarkshire:	London:	Distance/Online Learning:	Other:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Add name

Term(s) for Module Delivery					
(Provided viable student numbers permit).					
Term 1	<input type="checkbox"/>	Term 2	<input checked="" type="checkbox"/>	Term 3	<input type="checkbox"/>

<p><b>Learning Outcomes: (maximum of 5 statements)</b>  <b>These should take cognisance of the SCQF level descriptors and be at the appropriate level for the module.</b>            At the end of this module the student will be able to:</p>
---

L1	Design, develop and deploy a responsive, reliable, and secure full-stack web application using appropriate methodologies and technologies
L2	Evaluate the advantages and disadvantages of using different software stacks and implementation concerns in regard to architectural styles, APIs, and security to inform development of modern web applications
L3	Demonstrate a detailed understanding of the interactions and inner workings the various layers that make up a stack for web applications

<b>Employability Skills and Personal Development Planning (PDP) Skills</b>			
<b>SCQF Headings</b>	During completion of this module, there will be an opportunity to achieve core skills in:		
Knowledge and Understanding (K and U)	SCQF Level <b>10</b> Demonstrate a critical understanding of specialised subject areas and technological developments within web development		
Practice: Applied Knowledge and Understanding	SCQF Level <b>10</b> Practise the use of web development methodologies and technologies at a professional level in areas that may include a degree of novelty		
Generic Cognitive skills	SCQF Level <b>10</b> Identify problems, analyse results, and interpret common error messages to solve problems in a logical manner.		
Communication, ICT and Numeracy Skills	SCQF Level <b>10</b> This subject area is entirely computer based so ICT skills feature heavily in the practice of the subject area.		
Autonomy, Accountability and Working with others	SCQF Level <b>10</b> Exercise autonomy and initiative to implement independently web applications at a professional level.		
<b>Pre-requisites:</b>	Before undertaking this module the student should have undertaken the following:		
	<table border="1"> <tr> <td><b>Module Code:</b> COMP07009 COMP07XXX COMP09XXX</td> <td><b>Module Title:</b> Introduction to Web Development Database Systems DevOps <i>Or equivalent</i></td> </tr> </table>	<b>Module Code:</b> COMP07009 COMP07XXX COMP09XXX	<b>Module Title:</b> Introduction to Web Development Database Systems DevOps <i>Or equivalent</i>
	<b>Module Code:</b> COMP07009 COMP07XXX COMP09XXX	<b>Module Title:</b> Introduction to Web Development Database Systems DevOps <i>Or equivalent</i>	
<b>Other:</b>			
<b>Co-requisites</b>	<table border="1"> <tr> <td><b>Module Code:</b></td> <td><b>Module Title:</b></td> </tr> </table>	<b>Module Code:</b>	<b>Module Title:</b>
<b>Module Code:</b>	<b>Module Title:</b>		

\*Indicates that module descriptor is not published.

<b>Learning and Teaching</b>	
<b>In line with current learning and teaching principles, a 20-credit module includes 200 learning hours, normally including a minimum of 36 contact hours and maximum of 48 contact hours.</b>	
<b>Learning Activities</b> During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	<b>Student Learning Hours</b> (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture/Core Content Delivery	24
Laboratory/Practical Demonstration/Workshop	24
Independent Study	152
	Hours Total
<b>**Indicative Resources: (eg. Core text, journals, internet access)</b>	
<p>The following materials form essential underpinning for the module content and ultimately for the learning outcomes:</p> <p>Whilst foundational textbooks will provide essential underpinning for the module, students will primarily rely on online resources and documentation for current technologies, reflecting the dynamic nature of the web development landscape.</p> <p>Using the MERN stack, books would include:</p> <p>Brown, E. (2019) Web Development with Node and Express. O'Reilly Media.</p> <p>Frain, B. (2020) RESPONSIVE WEB DESIGN WITH HTML5 AND CSS - THIRDEDITION : develop future-proof responsive... websites using the latest html5 and css techniques. S.L.: Packt Publishing Limited.</p> <p>Herron, D. (2020) Node.js Web Development. Packt Publishing Ltd.</p> <p>Vasan Subramanian and Springerlink (Online Service (2019) Pro MERN Stack : Full Stack Web App Development with Mongo, Express, React, and Node. Berkeley, Ca: Apress.</p>	
(**N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material)	

### Attendance and Engagement Requirements

In line with the [Student Attendance and Engagement Procedure](#): Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time.

For the purposes of this module, academic engagement equates to the following:

Attending all timetabled synchronous classes and engagement with asynchronous learning activities and resources.

### Equality and Diversity

The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: [UWS Equality, Diversity and Human Rights Code](#).

Aligned with the overall commitment to equality and diversity stated in the Programme Specifications, the module supports equality of opportunity for students from all backgrounds and with different learning needs. Using our VLE, learning materials will be presented electronically in formats that allow flexible access and manipulation of content (part-time and distant learning students should check with their programme leader for any queries). The module complies with University regulations and guidance on inclusive learning and teaching practice. Specialist assistive equipment, support provision and adjustments to assessment practice will be made in accordance with UWS policy and regulations.

(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)

### Supplemental Information

<b>Divisional Programme Board</b>	Computing
<b>Assessment Results (Pass/Fail)</b>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>School Assessment Board</b>	Business & Applied Computing
<b>Moderator</b>	TBA
<b>External Examiner</b>	A Jindal
<b>Accreditation Details</b>	n/a

<b>Changes/Version Number</b>	1.0
-------------------------------	-----

<b>Assessment: (also refer to Assessment Outcomes Grids below)</b>
Assessment for this module consists of a portfolio of practical work and a workbook documenting a development process.
Assessment 1 – Portfolio of Practical Work in the form of providing a working web application implementation and code to a set of given requirements including a demonstration. (50%)
Assessment 2 – Workbook/Laboratory notebook/Diary/Training log/Learning Log documenting the approach taken by the student's implementation demonstrating understanding and rationale for decisions made throughout the development process, including but not limited to design and planning (Front-End), implementation strategies (Back-end), security measures, deployment procedures and accessibility considerations. (50%)
(N.B. (i) <b>Assessment Outcomes Grids</b> for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed. (ii) An <b>indicative schedule</b> listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Module Handbook.)

**Assessment Outcome Grids (See Guidance Note)**

<b>Component 1</b>							
<b>Assessment Type (Footnote B.)</b>	<b>Learning Outcome (1)</b>	<b>Learning Outcome (2)</b>	<b>Learning Outcome (3)</b>	<b>Learning Outcome (4)</b>	<b>Learning Outcome (5)</b>	<b>Weighting (%) of Assessment Element</b>	<b>Timetabled Contact Hours</b>
Portfolio of Practical Work	X		X			50	-

<b>Component 2</b>							
<b>Assessment Type (Footnote B.)</b>	<b>Learning Outcome (1)</b>	<b>Learning Outcome (2)</b>	<b>Learning Outcome (3)</b>	<b>Learning Outcome (4)</b>	<b>Learning Outcome (5)</b>	<b>Weighting (%) of Assessment Element</b>	<b>Timetabled Contact Hours</b>
Workbook/Laboratory notebook/Diary/Training Log/Learning Log		X	X			50	-

<b>Combined Total for All Components</b>	<b>100%</b>	<b>- hours</b>
--	-------------	----------------

**Change Control:**

<b>What</b>	<b>When</b>	<b>Who</b>
Further guidance on aggregate regulation and application when completing template	16/01/2020	H McLean
Updated contact hours	14/09/21	H McLean
Updated Student Attendance and Engagement Procedure	19/10/2023	C Winter
Updated UWS Equality, Diversity and Human Rights Code	19/10/2023	C Winter
Guidance Note 23-24 provided	12/12/23	D Taylor
General housekeeping to text across sections.	12/12/23	D Taylor

**Version Number: MD Template 1 (2023-24)**