University of the West of Scotland

Module Descriptor

Session: 2024/25

Title of Module: **JavaScript Games: Programming Fundamentals**			
Code: **COMP09090**	SCQF Level: 9 (Scottish Credit and Qualifications Framework)	Credit Points: 20	ECTS: 10 (European Credit Transfer Scheme)
School:	School of Computing, Engineering and Physical Sciences		
Module Co-ordinator:	Derek Turner		

Summary of Module

This module is intended to develop student's abilities in the use of core web technologies: HTML5, CSS and JavaScript generated through TypeScript. This is done within the context of game development.

Students are introduced to HTML5 elements to add structure to web documents.

Cascading style sheets are added to control the appearance of structured elements.
The common features of CSS will be presented, and students will also be introduced to the range of CSS frameworks available which includes Bootstrap, Bulma, Material Design Lite, Materialize, Milligam, Pure, SemanticUI, Skeleton, Tacit, Tailwind, UIkit and encouraged to explore one of these to enhance the style of their web page design.

JavaScript is the most popular programming language because it can be applied to both client and server-side programming of web applications. Typescript is a Microsoft extension of JavaScript which adds structures and supervision to reduce code errors. Programmes written in Typescript are transcoded to JavaScript in the background.

The basic syntax and common constructs of TypeScript will be introduced.

The object oriented and functional approaches to programming will be contrasted.

The primary 3D gaming engine used will be BabylonJS. Students will gain a working knowledge of the use of BabylonJS code for aspects of scene production and interaction.

By the end of the module students will have a solid foundation in the fundamental elements required for JavaScript-based games and which could be used to develop an expanded game within a follow-on module.

- This module embeds the key "I am UWS" graduate attributes and in particular: Universal (critical and analytical thinking, Emotionally intelligent, Collaborative, Research-minded), Work Ready (digitally literate, problem solver, effective communicator, Motivated, Potential leader, Ambitious) and Successful (Autonomous, Innovative, Driven, Transformational)

Module Delivery Method

Face-To-Face	Blended	Fully Online	HybridC	Hybrid 0	Work-Based Learning
⊠	☐	☐	☐	☐	☐

See Guidance Note for details.

Campus(es) for Module Delivery

The module will **normally** 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:
⊠	☐	☐	☐	☐	☐	Add name

Term(s) for Module Delivery

(Provided viable student numbers permit).

Term 1	⊠	Term 2	☐	Term 3	☐

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

L1	Demonstrate and work with an understanding of the scope and defining features of HTML5, CSS and JavaScript, and Typescript, with an awareness of forefront developments.
L2	Apply JavaScript/TypeScript programming knowledge skills and understanding to a range of the principal elements required for the development of game scenes.
L3	Practise programming and design in ways that show awareness of own and others' roles and responsibilities.

Employability Skills and Personal Development Planning (PDP) Skills

SCQF Headings	During completion of this module, there will be an opportunity to achieve core skills in:
Knowledge and Understanding (K and U)	SCQF Level **9** A sound understanding of website production using HTML5, CSS and JavaScript. A working knowledge of a JavaScript framework supporting the development of a game and graphic applications.

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Practice: Applied Knowledge and Understanding	SCQF Level **9** Ability to work with standard approaches to create graphic elements for games development implemented in JavaScript, HTML5 and appropriate frameworks.
Generic Cognitive skills	SCQF Level **9** Identify and analyse code-based approaches to routine professional aspects of 3D scene implementation.
Communication, ICT and Numeracy Skills	SCQF Level **9** Offer professional level insights, interpretations, and solutions to communicate plan and implement 3D game scene ideas.
Autonomy, Accountability and Working with others	SCQF Level **9** Exercise autonomy and initiative in designing and developing web 3D interactive scenes.

Pre-requisites:	Before undertaking this module the student should have undertaken the following:	
	Module Code:	**Module Title:**
	Other:	
Co-requisites	**Module Code:**	**Module Title:**

*Indicates that module descriptor is not published.

Learning and Teaching
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.
Learning materials are provided as live in-class presentations and code demonstrations, supported by recorded video materials. Staff will provide feedback within face-to-face labs to guide and assist students working towards the creation of 3D scene elements and interactions.

Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	**Student Learning Hours** (Normally totalling 200 hours): (Note: Learning hours include both contact hours and hours spent on other learning activities)
Tutorial/Synchronous Support Activity	12
Laboratory/Practical Demonstration/Workshop	36

Independent Study	152
	200 Hours Total

**Indicative Resources: (eg. Core text, journals, internet access)

The following materials form essential underpinning for the module content and ultimately for the learning outcomes:

Development environment comprising:

Windows subsystem for Linux.

Docker desktop (for containerised development environment featuring Vite development server, Nodejs and typescript)

GitHub desktop as a convenient interface between local PC and cloud repository.

Visual Studio Code as a code editor (IDE)

Visual Studio Code extensions:

- Prettier as a code formatter
- Remote development which incorporates:
  - o WSL
  - o Dev Containers: allowing local code to be run and edited in a container
  - o Remote SSH
  - o Remote Tunnels
- Live server for website development

GIT to facilitate VSC connection to code repository.

Online Resources:

BaylonJs current documentation at http://Doc.babylonjs.com

Course notes available via Aula and external links.

Recommended reading:

Mcgrath, M. (2020). HTML, CSS & JavaScript. Leamington Spa, Warwickshire, United Kingdom: In Easy Steps.

Shenoy, A. (2018). CSS framework alternatives: explore five lightweight alternatives to Bootstrap and Foundation with project examples. California: Apress.

Chenard, J. (2017). Learning Babylon. Js.

Ferguson, R. (2019). Beginning javascript: The ultimate guide to modern javascript development. Berkerley, Ca.

Haverbeke, H. (2024). Eloquent JavaScript. [online] Eloquentjavascript.net. Available at: https://eloquentjavascript.net/.

Kereki, F. (2023). Mastering JavaScript functional programming- write clean, robust, and maintainable web and server code using functional JavaScript. Birmingham: Packt Publishing.

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Please ensure the list is kept short and current. Essential resources should be included, broader resources should be kept for module handbooks / Aula VLE.

Resources should be listed in Right Harvard referencing style or agreed professional body deviation and in alphabetical order.

(**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:

Submission of a 3D graphic scene exercises and active participation in 75% of scheduled sessions (including face to face and online formats)

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.]()

This module is suitable for any student. The assessment regime will be applied flexibly so that a student who can attain the practical outcomes of the module will not be disadvantaged. If required suitable adjustments can be made with taking advice if required from Learning Support.

(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

Divisional Programme Board	Computing

Assessment Results (Pass/Fail)	Yes ☐ No ☒
School Assessment Board	Creative Computing
Moderator	Marco Gilardi
External Examiner	N Whitton
Accreditation Details	This module forms a core component of a programme accredited by the British Computer Society
Changes/Version Number	Module delivery method changed to face-face. Learning and teaching method set to face-face.

Assessment: (also refer to Assessment Outcomes Grids below)
Assessment 1 Single assessed Component comprising: Practical Development Project – A portfolio website featuring 3D scenes and documentation according to scenarios specified in the module handbook 100%
(N.B. (i) **Assessment Outcomes Grids** 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 **indicative schedule** 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)

Component 1							
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Learning Outcome (5)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Documentation	✓	✓				20	2
Creative output/ Audiotapes/ Videotapes/ Games/ Simulations	✓	✓	✓			80	4

Combined Total for All Components	**100%**	**6 hours**