



<b>Unit Title</b>	Introduction to 3D Skills and Immersive Technologies (blended)
<b>FHEQ Level</b>	Level 4
<b>Unit Code</b>	CRC20102
<b>Credit Value</b>	30
<b>Unit Type</b>	Subject

Learning Hours (blended)			
Staff – Student Contact Hours		Independent Study Hours	
Classes (online)	60	Independent study	180
Supervised access to Ravensbourne resources	30	Preparation for assessment	30
<b>Total</b>		<b>300</b>	

**Unit Description**

Skills around making models, three-dimensional printing of models (3D) and making virtual environments (VR) are increasingly in high demand. This unit provides students with introductory skills in 3D and VR and some experience of 3D model making and creating virtual environments. The unit reflects industry requirements in the areas of: 3D Model Making and Prototyping, Industrial 3D Printing and 3D Visualisation and VR.

This course will also give students grounding in professional workflows, design processes, collaborative roles and relevant aspects of project management.

This unit will introduce industry-standard software such as Blender, Unity, Rhino and Magics; and provide an understanding of 3D creation and production workflows applicable in the creative industries. Overall, the students’ ability to conceptualise and visualise 3D images and models will be improved as well their ability to deploy these in other industrial settings.

Lectures will be delivered both online and face-to-face workshops to cover the following areas: 3D Visualisation; Model Making; 3D Printing; and Augmented / Virtual Reality.

The skills gained with industry standard software in each area are assessed in the formative Mid-Term Project and the summative Final Project. The online classroom sessions to develop these skillsets are interspersed with small group interactions between students and mentors to encourage interchange of ideas and experience of project planning and management.

Face to face workshops will take place in the Prototyping area at Ravensbourne to introduce the essentials of 3D printing and manufacture; along with physical modelling skills. Some parts of the course will be delivered at our industry partners Hobs 3D, at the Here East site on the Olympic Park in Stratford.

To reflect the industry-focused aspect of the course, there will be presentations from major software and hardware manufacturers; design and construction firms; and other industry professionals online. There will also be one-to-one online tutorial time to enable students to work on specifics of their individual work with the lecturers; and time for self-study is expected.

The Five Principles underpin the Mindsets and Skillsets Manifesto and are the foundation upon which all course curriculum frameworks and unit specifications are based. The relevant Principles as stated below have been mapped against the Learning Outcomes relevant to each course unit and at each level (see Programme Specifications for full description of the Five Principles):

1. Cultivate / Where the individual thrives.
2. Collaborate / Where disciplines evolve.
3. Integrate / Where education engages industry.
4. Advocate / Where purpose meets practice.
5. Originate / creativity meets technology.

## Unit Indicative Content

### Industry-wide Knowledge

- 3D design basics
- 3D modelling workflows
- 3D printing basics
- Physical realisation of models
- Developing interactive content
- Using VR and AR tools
- Deploying VR and AR in industrial settings
- Delivering working VR and AR apps

### 3D Specific Knowledge Area

- Unity (inc basic C# scripting)
- Rhino
- 3DSMax
- Blender
- Unreal Engine
- STL software
- Apps for Oculus

### Workflows

- 3D Model to print
- 3D Model to app
- 3D model to VR/AR headset

## Unit Aims

1. To develop the students' understanding of the principles of 3D design and their ability to apply these with specific tools.
2. To enable the students to demonstrate skills in making 3D models and deploying them to suitable output media, including physical prints and virtual reality experiences
3. To equip learners to review and compare various approaches for developing 3D solutions and their efficacy within specific industry use cases

## Unit Learning Outcomes

### LO 1 Research/Inspiration

Demonstrate your capacity for information gathering techniques using a wide range of sources, providing visual, contextual and industry case-study research as appropriate.

**Related Principle: ORIGINATE**

### LO 3 Development/Prototyping

Demonstrate a range of tests and solutions, informed by knowledge of the principles of the creative process.

**Related Principle: INTEGRATE**

### LO 4 (Pre) Production

Identify, select and apply an appropriate selection of processes, materials and methods that inform creative and academic practice.

**Related Principle: COLLABORATE**

### LO7 Employability

Evidence nurturing professional transferable and employability skills, including the ability to manage time and work to clear briefs and deadlines, respond to set goals, and communicate effectively.

**Related Principle: CULTIVATE**

## Learning and Teaching Methods

### For face-to-face course delivery option:

This unit will be delivered using a combination of:

- lectures/seminars
- Online activities
- Self-directed independent study
- Peer learning, group discussion, guest speakers

**For blended/online course delivery the following will apply:**

- Online lectures and seminars
- Online tutorials and group activities
- Virtual peer learning activities
- Physical face to face workshops on specialist equipment use and project realisation (e.g. 3D printing)

**Assessment methods and tasks**

<b>Assessment tasks</b>	<b>Weighting (%) (one grade or multi-grade unit)</b>
Brief progress report or visual presentation of developmental work	Formative only
Development of a demonstration piece to evidence skills acquired in the course. and a log or development work to evidence process	100%

**Indicative Assessment Criteria**

IAC 1: Evidence understanding of the principles of 3D design, 3D software and tools, and its industry contexts (LO1)

IAC 2: Demonstrate skills in designing and realising 3D models (LO3).

IAC 3 Application of 3D workflows and output methods within the theme areas of 3D modelling, printing and AR/VR (LO4).

IAC 5: Evidence nurturing professional transferable and employability skills, including the ability to manage time and work to clear briefs and deadlines, respond to set goals, and communicate effectively. (LO7)

**Essential Reading list**

Linowes, Jonathan. *Unity Virtual Reality Projects: Learn Virtual Reality by developing more than 10 engaging projects with Unity 2018*, 2nd Edition (Packt Publishing, 2018)

Smyth, Clifford. *Functional Design for 3D Printing: Designing 3d printed things for everyday use* (2017)

Brito, Allan. *Blender 2.8: The beginner's guide* Paperback (2019)

## Recommended Reading List

Brito, Allan. *Blender 2.8 for architecture: Modeling and rendering with Eevee and Cycles* (2019)