

Unit Title	Lights, Code, Making
FHEQ Level	Level 4
Unit Code	USE18105
Credit Value	15
Unit Type	Subject

Learning Hours			
Staff – Student Contact Hours		Independent Study Hours	
Classes	45	Independent Study	60
Supervised access to resources		Preparation for Assessment	15
		Unsupervised Access to Resources	30
Total			150

Unit Description

This unit provides basic skills in the programming and construction of interactive microprocessor-based product prototypes. The basic understanding of programming gained from *Coding, Figures, and Visuals* is expanded on in this unit.

You will be introduced to programming techniques for a popular physical computing platform as well as physical prototyping techniques, product usability testing and introductory electronics and make use of LED lighting, displays, motors, sensors, and/or other input output mechanisms. (Integrate Principle)

The unit leads to practical work on a microprocessor-based product which demonstrates the creative software, electronic and physical design skills that form the basis of a modern interactive design process. (Originate Principle)

You will learn how to source, organise and manage digital assets and sources required for the entirety of the design process (Collaborate Principle)

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

- Using computer editors and IDEs to develop software programs
- Basic electronics theory and practice
- Mathematics and logic for programming and computer graphics

- 3D prototyping with physical materials and software
- Independent working and task/project management
- Using graphic and visual design tools, including both software and pen and paper

Unit Aims

Develop a basic proficiency with physical computing and electronics

Understand basic mathematics and logic for computing

Gain experience with fast physical prototyping methods

Gain a basic working knowledge of media editing tools

Unit Learning Outcomes

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

LO 6 Critical and creative mindsets

Demonstrate enquiry into what makes good practice - both creatively and academically.

Related Principle: ORIGINATE

Learning and Teaching Methods

Briefings

Lectures

Project work

Seminars

Workshops

Group work

Online activity

Individual Presentations and critiques

Self-directed independent study

Assessment methods and tasks

More detailed assessment tasks will be specified in the brief.

Assessment tasks	Weighting (%) (one grade or multi-grade unit)
Portfolio of work with supporting physical and digital material detailing project research, process and development.	Unit assessed holistically (100% of unit)

Indicative Assessment Criteria

Assessment criteria are the basis on which the judgment of the adequacy of the work is made. A more detailed assessment criteria will be specified in the brief.

- Demonstrate a basic proficiency with physical computing and electronics (L03, L04)
- Provide evidence of understanding of mathematics and logic as they apply to physical computing (L04)
- Show skills applied to the development of display and interaction interfaces (L06)
- Demonstrate experience with fast physical prototyping tools (L03, L04)
- Evidence a creative working process using 3D design tools (L03, L06)

Essential Reading list

1. Banzi, M., Shiloh, M. (2011) *Make: Getting Started with Arduino*, Farnham: O'Reilly
2. Gertz, Emily (2012) *Environmental Monitoring with Arduino: Building Simple Devices to Collect Data About the World Around Us*, Farnham: O'Reilly
3. Igoe, Tom (2011) *Making Things Talk*, Farnham: O'Reilly
4. Margolis, Michael (2012) *Arduino Cookbook*, Farnham: O'Reilly