MEDI C1613: Principles of Light

Module Title:	Principles of Light
Language of Instruction:	English

Credits:	5

NFQ Level:	6

Module Delivered In	2 programme(s)

Teaching & Learning Strategies:	A mixture of active learning and prescribed learning will be implemented. Prescribed learning will take the form of lectures where the student will be introduced to core concepts in light and other forms of electromagnetic radiation to allow the student to develop their unistructural and multistructural knowledge in a controlled learning environment. Active learning will take the form of laboratory exercises where students will examine fundamental properties of light such as reflection, refraction, and inverse square path loss behaviour along with lens parameters and polarization filters. The goal of these active learning sessions in the laboratory will be to facilitate the student to be able to relate the prescribed knowledge of the lectures with real-life objects such as lenses and filters. Written assignments will be used to strengthen the understanding of both the prescriptive and active learning aspects of the module.

Module Aim:	The aim of this module is to allow the student the opportunity to understand difficult but fundamental ideas from Physics with an emphasis on their practical ramifications. It is furthermore envisioned that the knowledge developed here can later be extended as it will compliment later modules, which they will undertake in their degree, that focus on camera-operation, filming & lighting.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Describe the properties of light itself & objects that interact with or manipulate light.
LO2	Comprehend & measure light & the parameters of objects that interact with or manipulate light.
LO3	Relate the properties & measurements of light & associated objects with the principles of the technologies that capture, store, process and transmit light.
LO4	Demonstrate competency in the ability to measure and characterise properties of light such as wavelength, polarization & brightness.
LO5	Judge & appraise important parameters such as focal length, aperture, shutter speed, ISO and polarization with a view to applying these practically in photography & filmmaking.
LO6	Evaluate light-colour reproduction standards with a view to assessing image and film quality.
LO7	Develop problem-solving skills broad enough to be applied in an industry where the use of technology changes rapidly.

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*
No requirements listed

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Module Content & Assessment

Indicative Content
Waves & Units: Watts, Lux, SI units, review of algebraic manipulations, Scientific/Engineering notation & trigonometry, wave equation, amplitude, frequency, phase, period, constructive interference, destructive interference, relation of colour to frequency/wavelength, relation of brightness to amplitude.
Light Light reflection, refraction and absorption, diffraction and dispersion, rainbows & prisms, polarization of light, total internal reflection, fibre optic cables, electromagnetic spectrum, visual acuity & tristimulus, rods & cones, colour science, colour perception.
Optics & Cameras Lens types, lens behaviour, variable focal length lens set-ups, mirror types, mirror behaviour, aperture & f-stop numbers, focal length, shutter speed, ISO, lighting, specular & diffuse reflection, depth-of-field, magnification, 3D cinema, polarisation filters.
Images Real images, virtual images, inverted images, pixels, digital vs analog image capture, temporal sampling rate, CIE colour charts, TV & colour-reproduction standards, gamut calculations & comparisons, image quality, lens quality and resolution, modulation transfer function, image enhancement techniques.

Assessment Breakdown	%
Continuous Assessment	40.00%
Project	30.00%
Practical	30.00%

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	Every Week	1.00
Laboratory	Every Week	2.00
Independent Learning	Every Week	6.00
	Total Hours	9.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EETVM_B	Bachelor of Science (Honours) in TV and Media Production	1	Mandatory
CW_EETVM_D	Bachelor of Science in TV and Media Production	1	Mandatory