<table>
<thead>
<tr>
<th>Module Code</th>
<th>CS7029</th>
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<tr>
<td>Module Name</td>
<td>Visual Computing and Design</td>
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<tr>
<td>Module Short Title</td>
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<tr>
<td>ECTS weighting</td>
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<td>Semester/term taught</td>
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**Contact Hours**

This Module is split into two sections:

**Part A** "Graphic Design" taught by Donal O’Mahony

**Part B** "Visual Computing" taught by Rowan Hughes

**Part A (Graphic Design)** consists of 11 two-hour lectures over Semester 1. The main course material is delivered through illustrated lectures. These lectures are not circulated as lecture notes. Their function is to stimulate debate and introduce students to discourses, practices, processes and practitioners in historical and contemporary contexts. Students are expected to conduct self-directed study to further their particular interests. This activity is supported through the provision of the bibliography (see below).

**Part B (Image Processing and 3D Modelling)** consists of 22 two-hour lectures over Semester 1 & 2.

**Module Personnel**

Rowan Hughes, Donal O’Mahony

**Learning Outcomes**

On successful completion of the module, students will be able to:

**Part A (Graphic Design)**

- Identify key formal elements in graphic design processes and practices
- Analyse graphic design and visual cultural products in an informed and structured manner
- Evaluate these products in terms of formal (i.e. functional) success and socio-cultural & technological relevance

**Part B (Visual Computing)**

- Students are introduced to the mathematical principles and standard architectures of modern graphical applications, including details of the hardware and low-level software used in such systems.
- The course will give an understanding of how low-level fundamental components common to all computer applications come together to produce the high-level abstract output in graphical applications to generate computer imagery.
- Furthermore, students will gain hands-on experience in a number of well-known tools used in modelling, photo-realistic image rendering, animation and interactive program design.
Module Learning Aims

Part A (Graphic Design)
- Introduce students to some of the key formal elements of graphic design practices
- Introduce students to some of the major historical and critical debates concerned with graphic design and visual cultural products
- To encourage students towards a critical engagement with visual cultural / technological intersections

Part B (Visual Computing)
- The objective of this course is to equip students with a fundamental understanding of the technology underlying the field of computer images and how this is applied to advanced areas such as geometric modelling, rendering and animation.
- We will discuss modes of input/output and the limitations/potentials of (graphical) digital media and attempt to provide a better understanding of the production processes, complexity, tools and issues involved in production of digital images and animations.

Module Content

Part A (Graphic Design)
- Information Design
- Typography
- Identity Design
- The Photographic Image

Part B (Visual Computing)
- The mathematical principles used in computer graphics
- An Introduction to Computer Generated Imagery
- Problem Domain and Applications
- Images: Representation, Storage and Retrieval
- Raster and Vector Graphics
- Colour Perception and Computer Graphics
- Graphics Hardware
- Image Manipulation, Enhancement, Filtering
- 3D Graphics
- 2D and 3D Modelling formats
- Illumination and Lighting
- Camera Modelling, Viewing and Projection
- Texture Mapping
- Animation
- State of the art examples of Image Processing and Computer Graphics
- Practical components involving labs will use the following applications:
  - POV-Ray
  - 3D Studio Max
  - Processing
## Recommended Reading List

### Part A (Graphic Design), Required Reading is in bold

#### Primers & Handbooks

- Adobe Creative Team; *Classroom in a Book: Adobe Photoshop CS(6)*. Indianapolis: Adobe Press, 2012. (This title must correspond to the software installed on your computer. Check the software release number before purchasing / borrowing)
- Adobe Creative Team; *Adobe Illustrator CS(6) Classroom in a Book*. Indianapolis: Adobe Press, 2005. (This title must correspond to the software installed on your computer. Check the software release number before purchasing / borrowing)

#### Design Histories


#### Design Criticism


#### Typography

- Design Baines, Phil & Andrew Haslam; *Type and Typography*. London: Laurence
• Kane, John; *A Type Primer*. New York: Prentice Hall, 2002.

**Writing by Designers**


**Visual Culture**

• Williams, Raymond; *Keywords*. London: Fontana, 1976.

**Information Design**


**Photographic Images**


**Part B (Image Processing and 3D Modelling)**

The following are recommended readings. Each text covers somewhat equivalent scope.

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<th>Module Pre Requisite</th>
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<td>Module Co Requisite</td>
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<td>Assessment Details</td>
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