

## 2022/ 2023 TY Module- Parametric Modelling And Design.



### Aims

To develop the cognitive and practical skills associated with communication graphics, problem solving and critical thinking.

To develop the capacity and ability of students in the area of Visio-spatial .reasoning.

To provide a learning environment where students can plan, organize and present appropriate design solutions using a variety of skills, techniques and media. To provide a basis for lifelong learning.

To develop an appreciation for, and understanding of, aesthetic principles and their importance in design and the human environment.

### On completion of their studies students should be:

- Familiar with the principles, concepts, terminology and methodologies associated with the graphics code.
- Able to apply the principles of both plane and descriptive geometries to the solution of a variety of concrete and abstract graphic problems.
- Able to produce neat and accurate drawings that comply with internationally recognized standards and conventions.
- Able to model, in two and three dimensions, graphic design problems and solutions, utilising a range of appropriate techniques and media with confidence and discernment.
- Appreciative of the facility which the graphics code provides, in the solution of problems and in the visual communication of data.
- Able to utilize freehand sketching, both two and three dimensional, as a means of communication and as an aid to spatial reasoning and refinement.
- Able to utilize a variety of rendering and presentation techniques in the solution of graphic design problems, in both two and three dimensions.
- Competent and confident in the application of CAD and other appropriate Information and Communications Technologies (ICT) in the solution, modeling and presentation of graphic design solutions, in two and three dimensions.
- Able to interpret verbal, written and mathematical information, and to represent it Graphically.

- Able to evaluate design solutions and solve design problems on the basis of sound aesthetic principles and to appreciate the impact of design on the visual quality of the human environment.

### Rationale for selection of subject matter

The subject matter should be structured sequentially and logically to provide appropriate visualisation and spatial awareness, ranging from basic deduction to abstract awareness.

### Organisation of learning experience

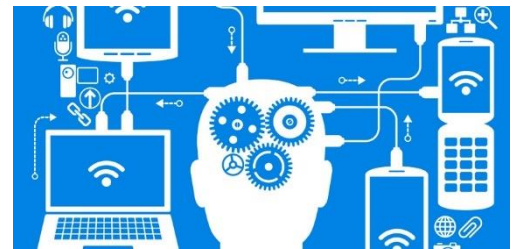
The experience will be organised into progressional blocks, each covering a different concept or problem.

### Content Of Module

Term 1-September to October- Both topics to run concurrently.

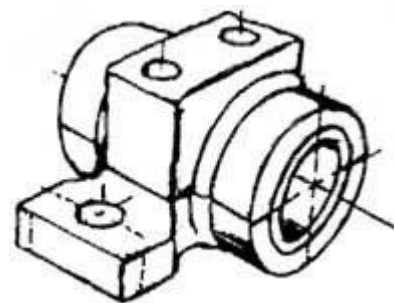
#### I.C.T.

- Create folder and save files.
- Import / export files.
- Generate drawings from part and assembly models.
- Realise the design intent in the CAD models - modify files.
- Use CAD models to explore geometric principles.
- Generate exploded views & animated sequences.
- Transfer images from CAD to ICT packages -make presentation
- Collect/manipulate images to achieve special effects.



#### Freehand Drawing

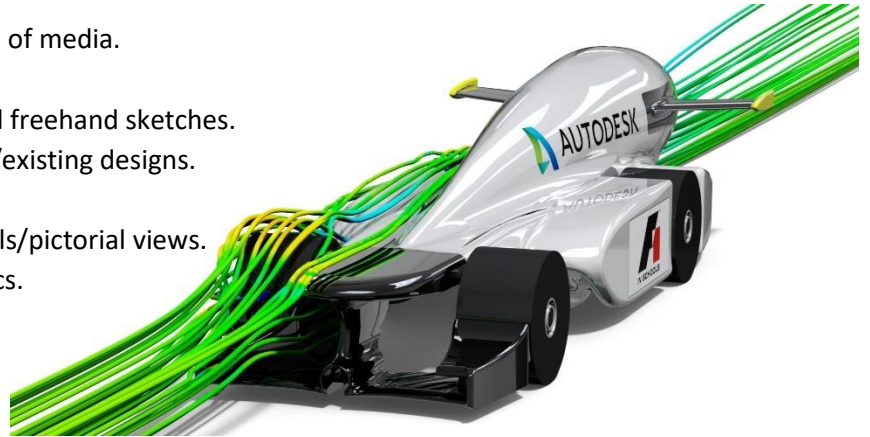
- • Observation techniques.
- • Develop freehand sketching techniques.
- • Produce sketches of basic solids.
- • Select the most suitable medium for producing sketches.
- • Use various methods of rendering & coloring.
- • Identify the surfaces of an object relative to one another in 3D.
- • Analyze the texture and color of a surface.
- • Represent graphically the effects of light and shade.



## October to Christmas

### Student Project- Dragster Racer

- • Capture images using a range of media.
- • Analyse design
- • Communicate using rendered freehand sketches.
- • Generate CAD model of new/existing designs.
- • Modify CAD files.
- • Produce exploded CAD models/pictorial views.
- • Introduction to Flow Dynamics.
- • Marketing



## January Assignment-6-9weeks Candle Lanterns

Practically every household has at least one Candle Lantern. Since the invention of the Lantern, these artefacts have become more compact and are now manufactured from a wide range of materials. Many of the existing designs are novel in terms of their shape and form.

(A) Carry out a design investigation of existing Candle Lanterns in graphic format. Your investigation should begin with a brief exploration of the historical development of the lantern and should include an analysis of shape, features, colour, materials, etc. and (B) Show graphically how you would physically modify a chosen Lantern to improve its overall design.

Output 1 - Design Research

Output 2 - Design Feature Comparison

Output 3 - Freehand Graphics

Output 4 - Solidworks Parts, Assembly, Drawings and eDrawing files

Output 5 - Hardcopy Output from Solidworks

Output 6 - Photorealistic Representation

Output 7 - Graphical Exploration of Design Solutions

Output 8 - Presentation of Modification / Concept Design

Output 9 - Hardcopy Output from Solidworks



## February to Easter

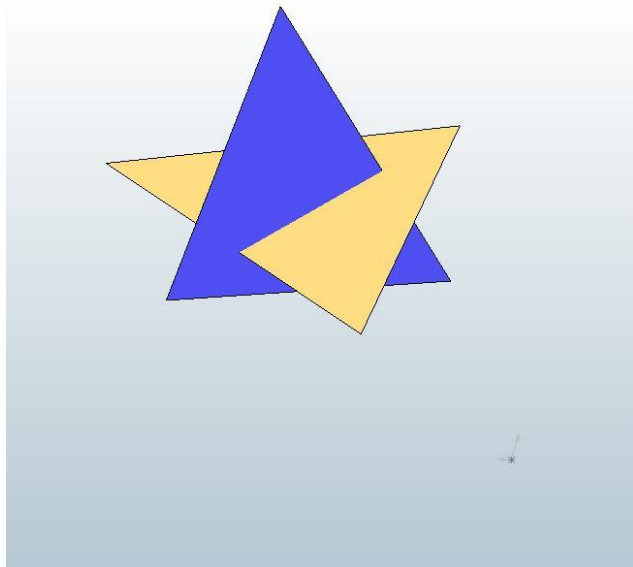
### Graphics in design and communication graphics- Continuation Of Projects.

- Interpret/generate design briefs.
- Develop a plan.
- Display rudiments of good design - compare/contrast.
- Compare/contrast manual v electronic graphic communication.
- Represent 3D objects in logically arranged 2D views.
- Generate multi-view drawings from 3D models.
- Use slides or animations to illustrate graphic solutions.
- Evaluate design with reference to criteria.

## Easter to Summer

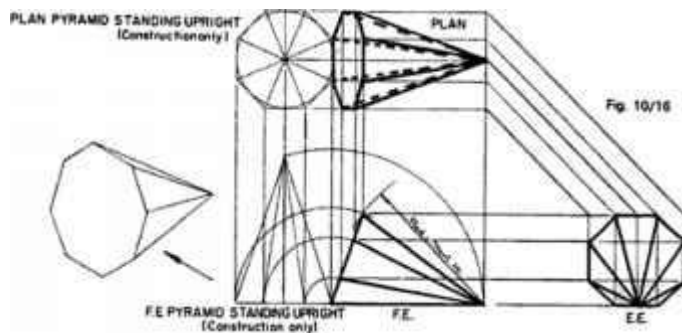
### Auxiliary Projection, Intersecting Planes and Skew Lines.

- Understanding of planes of reference.
- Auxiliary elevations.
- Auxiliary plans.
- True shape of surfaces.
- Intersecting planes.
- Dihedral angles between planes.
- Shortest horizontal distances.
- Skew lines.



## Projection Systems

- Planes of Reference, Orthographic Proj, 1st Auxiliary Views
- True length & shape.
- Proj of right solids, Solids in contact, Sectional views (1), Pictorial Projection.
- Oblique planes, Sectional views (2), Intersection of solids
- 2nd Auxiliary views, Intersection of solids.
- 3rd Angle Projection, Cube and tetrahedron, Solids in Contact.
- Axonometric, Projection- Isometric, diametric & trimetric.
- Perspective, projection-Vanishing points for inclined lines.



## Assessment:

1. Finished assignment assessment – Assignments will be Corrected in Conjunction with the Standard Leaving Cert Guidelines/Procedure.
2. Continuous in-class assessment - In class questioning on new and revised material occurs daily.
3. Formal assessment is carried out on a regular basis as a means of assessing student learning and retention. These assessments usually coincide with the completion of a topic.

