



Junior Certificate Examination, 2021

Technology

Design Tasks

Ordinary Level - 240 marks

Higher Level - 200 marks

The design briefs for the Junior Certificate Examination 2021 are given overleaf.

The Design Task must be available for assessment by Friday 23 April 2021.

Instructions to candidates:

1. Design and make any **one** of the design tasks listed opposite.
2. The design task submitted for assessment must consist of two components: a design folder **and** an artefact.
3. If **either** assessment component (written examination or coursework) is submitted at Ordinary Level, the subject is graded at Ordinary Level.
4. All work submitted for assessment must be clearly identified with your examination number.
5. Tasks submitted for assessment must be the candidates **own individual work**.
6. The design task must be completed **in school** under the supervision of the class teacher.
7. When using research sources, including the Internet, the sources must be acknowledged. Research material copied directly from the Internet or from other sources and presented as your own work will not receive any marks.
8. Shading and colour should be used where appropriate in your design folder.
9. Coursework which does not demonstrate a range of manual processing skills and appropriate assembly techniques as outlined in the syllabus will lose marks.
10. Coursework where specialist processes (e.g. CAD CAM) are used, but are not supported in the design folder by the inclusion of drawings and/or descriptions as appropriate will lose marks.
11. If microprocessors are used in the electronic sub-system a diagram showing the relevant Inputs and Outputs as well as the flowsheet/program should be included in your design folder.
12. All important operating features must be easily accessible.
13. Presentation and finished appearance of both folder and artefact are important.

The Design Task must be available for assessment by Friday 23 April 2021.

Storage of design tasks:

On completion of the design task, school authorities should ensure that the finished artefact and design folder are kept in a safe place under lock and key until the examining process (including appeals) has concluded.

Allocation of marks:

Design Tasks

240 marks are allocated for design tasks at Ordinary Level.

200 marks are allocated for design tasks at Higher Level.

The Design Folder

Forty percent (40%) of the marks are allocated for the design folder.

The Artefact

Sixty percent (60%) of the marks are allocated for the artefact.

Technology Design Tasks 2021

Complete **any one** of the following tasks using a range of materials and manufacturing processes:

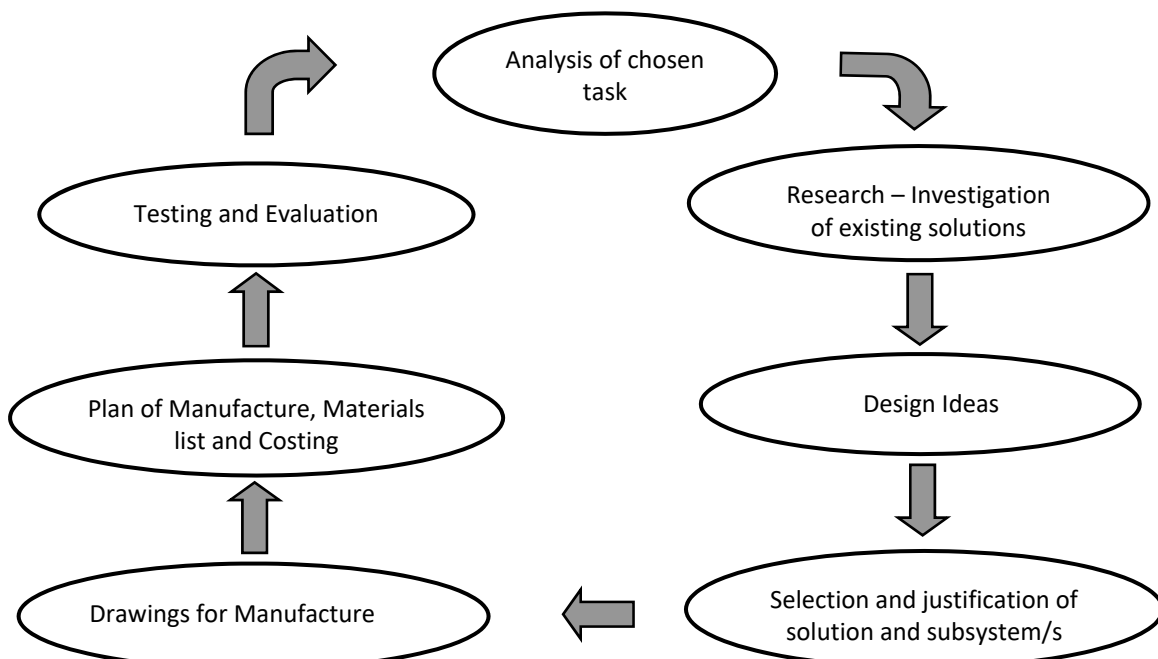
- A. Design and make an **electro-mechanically controlled, linear camera track dolly-slider**. The dolly should be designed to hold your mobile phone while shooting video and must include limit switches as part of the control system.
- B. Design and make a working model of an **electro-mechanically controlled retractable bridge**. Your solution must include limit switching to control the bridge at its fully extended and fully retracted positions.
- C. Design and make a **novelty cold-air nail drier for children** (for nail varnish) which starts automatically when one's hand is placed in the unit. Appropriate safety precautions must be included.
- D. When camping and hiking it may be difficult to obtain clean drinking water. UV LED light is often used to treat water to make it drinkable. With this in mind design and make a working model of a **mechanically powered UV LED unit that can be used to treat a bottle of water** (such as from a stream) to make it safe to drink. The unit should be portable.
- E. Design and make a working model of an **electro-mechanical log splitter**. Your design should include suitable safety features.
- F. Garden cultivators are very useful machines for breaking up the soil before planting vegetables. Design and make a working model of a **battery powered self-propelled garden cultivator**.

NOTE:

- Power sources should be provided where necessary and must not exceed 12V DC.
- Where appropriate, operating features such as switches should be clearly labelled.

Information for examination candidates:

A simple model of a design process is shown below. It is recommended that you follow the logical sequence of this design process and that evidence of each stage is reflected in your design folder.



Marking Scheme

The table below gives an outline of the marking headings used to assess your task. While the same headings apply at both levels, the marking criteria at Higher Level demand greater detail and precision in both the design folder and the artefact. While the general headings and marks will largely remain the same, assumptions about future marking schemes on the basis of past schemes should be avoided.

Ordinary and Higher Level marking schemes are available on www.examinations.ie

It is recommended that evidence of each stage is reflected in your design folder.

Folder		
Analysis of brief	Analysis should incorporate the following features: Breakdown of the brief and design specification/list of objectives specific to the task.	5
Investigation of possible solutions	Evidence of investigation: (sketches, photos, descriptions, etc.) Relevant research on the task itself and its mechanical/electronic systems.	5
Design Ideas	One Design Idea presented in 3D format (Ordinary level). Two Design Ideas presented in 3D format ((Higher level).	6
Criteria for selection of solution	Valid justification of your selected idea and the sub-system/s.	4
Sketches /drawings for manufacture	Working drawings of the chosen solution and circuit drawing/s (flow-sheet where applicable).	6
Manufacturing sequence/processes	Sequence of events for the manufacture of the chosen solution. Materials List with sizes and costs.	6
Testing and Evaluation	Evidence of testing/modification during manufacture and evaluation against the brief/design specification and/or third party evaluation.	4
Presentation of folder	Layout: use of diagrams, sketches, photographs, neat and orderly.	4
Artefact		
Artefact satisfies brief	Does the artefact produced by the candidate satisfy the brief?	5
Suitability, Functionality	Do all the necessary elements of the artefact function?	5
Design/Inventiveness	Inventive design of the artefact and sub-system?	5
Originality, commercial comp.	Creative use of materials/recycled parts/electro-mechanical components/mechanisms/colour/shape. Acceptable use of commercial components?	5
Appropriateness of materials	Materials selected suited to their respective functions?	6
Appropriate sub-system(s)	Appropriate electro-mechanical/electronic sub-system?	6
App. manufacturing processes	Complete artefact and sub-system manufactured using appropriate processes?	6
Quality of processes	Quality of the artefact after manufacture?	6
Assembly	Appropriate methods of assembly used? Quality of assembly.	4
Detailed finish/Safety Considerations	No sharp edges or safety hazards (loose parts, toxic paints etc.?)	4
Tech. competencies/ Application of skills	Appropriate level and range of skills/technological competencies?	4
Overall presentation	Attractive, well presented artefact?	4