



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Cycle Examination 2024

Engineering

Project Coursework

Common Level

To be completed by Friday 19th April 2024

210 marks

Instructions to candidates

1. The project coursework for Junior Cycle Engineering consists of the:
 - manufacture of a **Model Gullwing Vehicle** – 210 marks.
2. Please familiarise yourself with the adjusted assessment arrangements for candidates taking the state examinations in the 2023/24 school year, that were issued by the Department of Education. As a result of these adjustments the '*Design Element*' of this coursework, consisting of a Design Brief, Design Folio and Design Realisation, is not examinable and will not have marks allocated to it in 2024. Therefore, candidates are not required to complete this element of the coursework.
3. As a result of these changes, the total mark allocation for this coursework in 2024 is 210 marks, instead of the usual 280 mark total. However, the relative weighting between the coursework (70%) and the written paper (30%) will be retained. This will be achieved by reweighting the coursework mark before it is combined with the mark for the written component.
4. An outline marking scheme is shown on page 8.
5. Details of the **Model Gullwing Vehicle** are shown on the accompanying drawings, pages 4 – 6.
6. Make and assemble the Model using the materials specified in the **Parts List** (page 7).
7. **Note:** Please ensure the **Motor Adaptor (Part 16 and Part 39)** are secured to the shaft of the **3V Motorised Gearbox (Part 40 and Part 41)**, using the grub screws provided.
8. The **Battery Holder (Part 44)** is to be bonded to the inside of the **Rear Panel (Part 5)**.
9. Complete, test and solder the Electric Circuit.
10. Your **Examination Number** must be clearly shown, on the model, in the position indicated on the drawing (page 4).
11. Your completed coursework must be available for assessment by **Friday 19th April 2024**.
12. **Note:** So as to authenticate **your own individual work**, where specialist processes (e.g. CAD/CAM) are used, these must be supported by the inclusion of drawings and/or descriptions as appropriate.
13. For further information on this project please see the video at the URL shown below.
<https://www.examinations.ie/video/index.php/JCEngineering2024>

Instructions to candidates

Acceptance and Authentication of Coursework: (See circular S76/22)

1. The coursework you submit for assessment must be **your own individual work** and must be completed in school under the supervision of your teacher.
2. Your model must not be removed from the school under any circumstances, as doing so may result in the coursework being considered invalid and no marks will be awarded.
3. So as to authenticate **your own individual work**, where specialist processes (e.g. CAD/CAM) are used, these must be supported by the inclusion of drawings and/or descriptions as appropriate.
4. You must reference and acknowledge all research sources used such as: publications including books, professional journals and government reports; online sources and other types of media; any material generated using artificial intelligence (AI) software or applications; and material from specialist organisations and relevant individuals. To include such material without properly referencing the source will be considered plagiarism. In addition, the copying from, or reproduction of, material from such sources may also be considered plagiarism.
5. Any case of suspected copying, plagiarism (which includes the use of AI software), improper assistance, or procurement of work prepared by another party will be thoroughly investigated.
6. **Note:** It is your responsibility, as the candidate, to comply with these instructions. If you fail to comply with these instructions, your teacher will not be able to validate and sign off on your coursework and you will not receive any marks for it.

Note:

- *The circumstances in which the Minister for Education may withhold marks from candidates are set out in the “Rules and Programme for Secondary Schools”.*
- *Anyone who helps a candidate to break examination rules can be prosecuted under the Education Act 1998.*

Storage of Coursework

On completion of the coursework, school authorities should ensure that the finished Model is kept in a secure place until the examining process (including appeals) has concluded.

Note to Teachers

* Parts 2, 5, 7, 8, 10 and 11

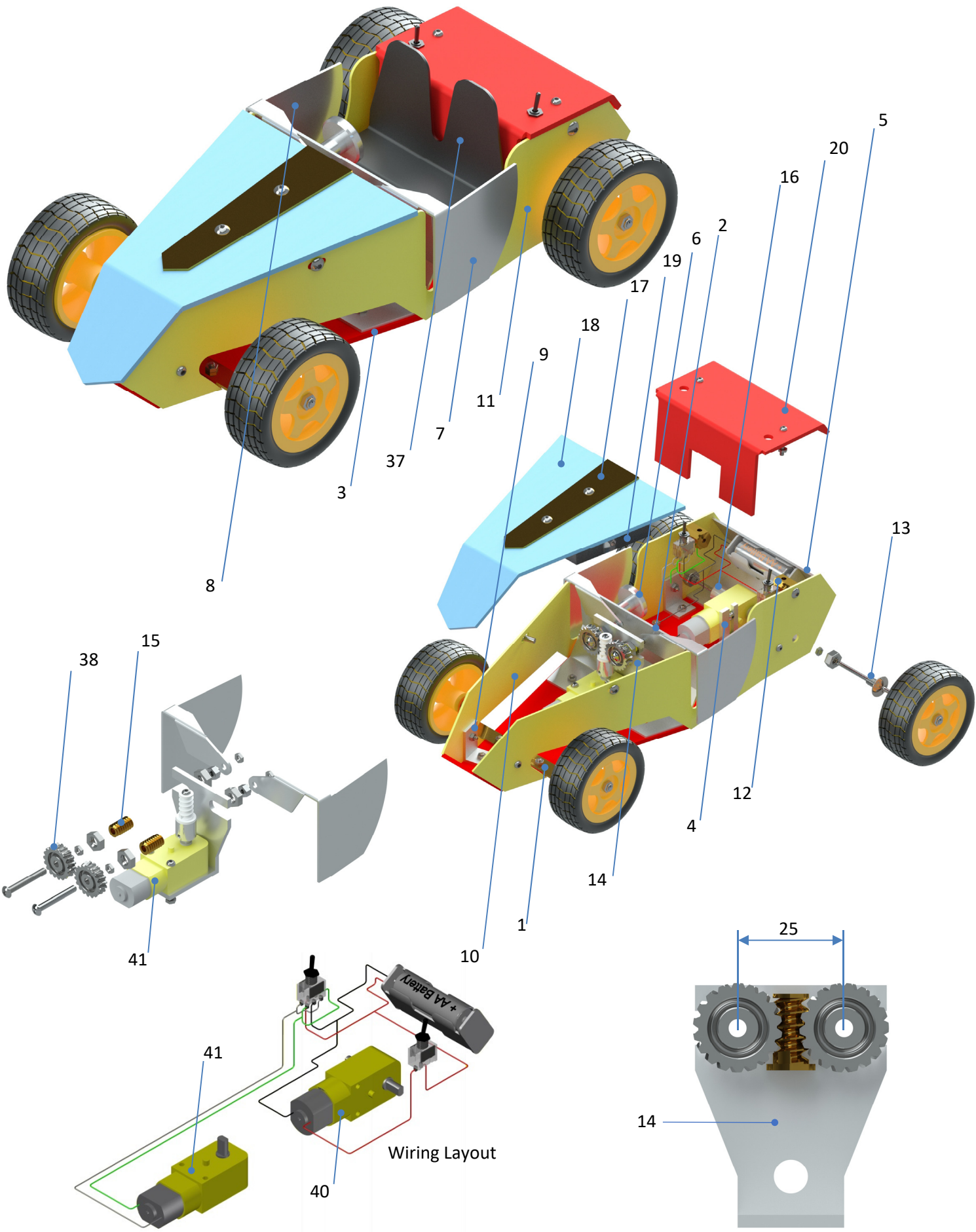
- These parts may be finished using vinyl-wrap, polished or painted.

** Part 37 – Seat, and Part 38 – Worm and worm gears

- Schools may choose to 3D print these components or make alternative arrangements to source these components.
- The STL Files for 3D printing these components are available to download on the SEC website at the URL shown below.

<https://www.examinations.ie/video/index.php/JCEngineering2024>

Model Gullwing Vehicle – Assembly Drawing



PARTS LIST			
Part No.	Part Name	Required	Material and Description
1	Front Axle Support	1	1.5 mm, Brass (polished)
2	Dash Panel	1	1.5 mm, Aluminium * (See note page 3)
3	Chassis	1	3 mm, Tinted Acrylic (polished)
4	Drive Motor Holder	1	40 × 20 × 3 mm, Angle Aluminium (Polished)
5	Rear Panel	1	1.5 mm, Aluminium * (See note page 3)
6	Steering Wheel	1	Ø25 mm, Aluminium (polished)
7	Left Door	1	1.5 mm, Aluminium * (See note page 3)
8	Right Door	1	1.5 mm, Aluminium * (See note page 3)
9	Side Panel Support Bracket	4	25 × 15 × 2 mm, Aluminium Angle (polished)
10	Right Side Panel	1	1.5 mm, Aluminium * (See note page 3)
11	Left Side Panel	1	1.5 mm, Aluminium * (See note page 3)
12	Boot Cover Support	2	12 mm, Hexagonal Aluminium or Brass (polished)
13	Rear Axle Bushing	2	M6 × 10, Mild Steel Gutter Bolt
14	Door Motor Bracket	1	60 × 60 × 3 mm, Aluminium Angle (polished)
15	Door Bushing Support	2	M8 Threaded Bar
16	Drive Motor Adaptor	2	Ø12 × 12 mm, with M4 Hole and Grub Screws
17	Bonnet Strip	1	1.5 mm, Aluminium or Brass (polished)
18	Bonnet	1	3 mm, Coloured Acrylic (polished)
19	Bonnet Support	1	12 mm, Clear Acrylic (polished)
20	Boot Cover	1	3 mm, Coloured Acrylic (polished)
As Supplied			
21	Nut	22	M3, Steel
22	Nut	12	M4, Steel
23	Nut	2	M6, Steel
24	Half Nut	4	M8, Brass or Steel
25	Locknut	5	M4, Steel
26	Cap Nut (Rear Wheels)	2	M4, Steel
27	Screw	8	M4 × 10, Allen Button Head or Pan Head, Steel
28	Screw (Front Axle)	2	M4 × 35, Allen Button Head or Pan Head, Steel
29	Screw (Doors)	2	M4 × 30, Allen Button Head or Pan Head, Steel
30	Screw (Steering Wheel)	1	M4 × 20, Allen Button Head or Pan Head, Steel
31	Screw	16	M3 × 8, Allen Button Head or Pan Head, Steel
32	Screw (Door Motor)	2	M3 × 30, Allen Button Head or Pan Head, Steel
33	Screw (Drive Motor)	2	M3 × 25, Allen Button Head or Pan Head, Steel
34	Screw (Boot Cover/Worm)	3	M3 × 20, Allen Button Head or Pan Head, Steel
35	Washers (Drive Motor)	2	M3 Flat Washer, Steel
36	M4 Threaded Bar	2	Rear Axle, 69 mm
37	Seat	1	3D Printed ** (See note page 3)
38	Worm and Worm Gears	1 Set	3D Printed ** (See note page 3)
39	Motor Adaptor (Door)	1	Ø12 × 12 mm, with M3 Hole and Grub Screws
40	3V Motorised Gearbox (Drive)	1	Inline Motor, Dual Shaft – Ratio 120:1
41	3V Motorised Gearbox (Door)	1	Inline Motor, Single Shaft – Ratio 200:1
42	Switch	1	DPDT Spring Loaded Toggle – Centre Off
43	Switch	1	SPST Toggle
44	Battery Holder	1	2 × AA
45	Wheel	4	Ø70 × 27 mm, with 4mm Axle Hole

Outline Marking Scheme

The table below gives an outline of the marking headings that will be used to assess your completed coursework. While the general headings and marks below will largely remain the same, mark allocations may vary depending on the actual project and 'Design Element' for any given year.

Model Gullwing Vehicle – Outline Marking Scheme	
Section 1: Complete Model	
<i>Headings</i>	<i>Marks</i>
Assembly	20
Finish	20
Mechanical Function	15
Electrical Function	15
Section 1 - Total	
70	
Section 2: 'Design Element' (Not required for 2024 – See page 2)	
Section 2 – Total	
-	
Section 3: Manufacture	
<i>Headings</i>	<i>Marks</i>
Parts 1 & 5	10
Parts 2 & 6	10
Part 3	10
Parts 4, 13 & 16	15
Parts 7 & 8	15
Parts 14 & 15	10
Section 3 - Total	
70	
Section 4: Manufacture	
<i>Headings</i>	<i>Marks</i>
Parts 10 & 11	20
Parts 9 & 12	15
Parts 17 & 18	15
Part 19	10
Part 20	10
Section 4 - Total	
70	
Overall Total in 2024	
210	