

2014 Formula Student Class 2 Regulations

1. CLASS 2 - Overview

Class 2 is specific to Formula Student and is designed to accommodate teams that are not in a position to enter Class 1 immediately with a full running vehicle. In principle it is assumed that a Class 2 design is capable, 12 months later, of being a full running Class 1 entry.

You are therefore required to consider fully all of the FS Class 1 Rules and Regulations in parallel with these FS Class 2 Supplementary Regulations.

As Class 1 includes alternative fuelled vehicles, it is assumed that a Class 2 entry pays full attention to this important FS specific fact. For the avoidance of doubt, a key design choice for which entrants must provide detailed understanding is that of Powertrain conceptual choice.

However, many of the regulations remain identical to FSAE and so you must also fully understand the FSAE event objectives (i.e. those applicable to Class 1 running vehicles) and the intended customer and manufacturing realities.

The organisers will provide adequate space for a display area for each Class 2 team. Teams are required to supply their own displays and supporting structure, showing their vehicle and giving details of their design and development work.

Note: Class 2 entrants must submit a Business Logic Case (see Section 5 of this document). The template will be available on the Forms webpage.

Points will be awarded for the following:

2. Design (150 points)

Prior to the event, teams will submit a Design Report and Design Spec Sheet. These documents should reflect the current state of development of the designs and outline plans for resolution of outstanding issues/manufacture. Late submission of documents will be penalised as per the Class 1 regulations. Note that Class 2 entrants are not required to submit an Impact Attenuator Report. Submission dates are on the website.

Understanding that the vehicle design is incomplete, i.e. a non-running vehicle, the judges will be looking at the project planning as well as the design process and will be looking to see evidence of understanding of proposed manufacturing methods and their implications (e.g. costs, tooling requirements, etc).

Judges expect to see proof of reasoning for key design and concept choice decisions. Given that Class 1 now accommodates alternative powertrain technology possibilities it is expected that teams will outline their basic conceptual choice in this regard in some detail. In recognition of the "real world" it is further expected that teams will consider fully the costs of manufacture, service and safety of innovative design choices in addition to the usual parameters of mass and *performance* and customer appeal. You should note that there will be an increased link between the information provided to Cost, Manufacturing & Sustainability, Design and Business Presentation static event judges, e.g. proposed production volumes given for the Business Logic Case will be assumed to

apply to Cost, Manufacturing & Sustainability and Design as well as Business Presentation.

Please note that it is **essential** that some component parts are manufactured in order that teams may demonstrate their understanding of manufacture. This is not solely a paper design concept class: designs must have their basis in reality with specific reference to the Class 1 FS Rules and intents as a long term future objective. Teams that present only the smallest or simplest parts for judging will naturally be awarded their points accordingly.

At the event, teams will give 15-20 minutes of informal presentation about the engineering design of their vehicle. This will be followed by a 20-30 minute discussion with the design judges about the designs, concepts and analyses presented, and to view the drawings and components etc. that have been produced.

Points will be awarded according to the specific FS Class 2 Design Scoring Sheet.

3. Business Presentation (75 Points)

This will follow the same basic format as that described for the Business Presentation event in the Class 1 Formula Student Rules. You should read these rules fully and adhere to the requirements set out for the Business Presentation static event. Teams are advised to include the topics contained within their BLC as part of their Business Presentation.

This involves a 10-minute formal presentation to senior executives from an imaginary company (or investor) followed by 5 minutes of questions, with a view to obtaining a business deal to manufacture and sell the team's car. The judges will assess your Business Presentation on the basis that you have a partially developed prototype car but have a well developed business case and project plan.

The scoring criteria differs slightly from the FSAE scoring with additional weighting given to Content (40% of the marks are allocated to Content; the remaining marks are equally allocated to Organisation, Visual Aids, Delivery and Q&A). The detailed scoring sheet is not published but the broad topics are in line with the standard FSAE scoring sheet. A penalty will be imposed if the presentation exceeds 12 minutes or if the presentation is excessively short in duration. Teams will be asked to rapidly conclude their presentation if they overrun significantly.

The Business Presentation should also briefly address the environmental credentials of the project and proposed vehicle. This will be assessed under the 'Content' section of the Business Presentation. This is not to be confused with the sustainability part of the Cost, Manufacturing and Sustainability static event and its associated presentation.

For the convenience of the Business Presentation Event judges, teams giving a PowerPoint or similar style presentation are required to hand a paper copy of their slides, preferably in colour, to the judges at the end of the Question and Answer session.

Teams are reminded that the Business Presentations will be held in the Business Presentation judging rooms, NOT at your display area.

No pre-event document submissions are required for the Business Presentation event. Therefore, there are no pre-event document submission penalties.

4. Cost, Manufacturing & Sustainability (150 Points)

At the event, teams will provide a hard copy of their Cost report to the judges whilst they are being judged (a posted copy prior to the event is not required). This will meet the same formatting and other requirements of the FSAE rules, but reflecting only the costs for producing the chassis (frame and body), and sustainability (embedded CO₂) for the chosen powertrain.

Reports do not need to be submitted before the event.

At the event, teams will give a 10 minute presentation on the overall project management, followed by 10 minutes of questioning from the cost judges on the likely costs and manufacturing and management processes implied by the team's designs and ideas (similar to the cost event described in the FSAE Rules). The questions (and points) will be split equally between the overall cost estimates and management plans for building a complete car of the team's design within the next year, and the costing of the chassis (frame and body).

Teams are expected to produce a Sustainability Report detailing the embedded CO₂ for the chosen powertrain. This will be a final 10 minute presentation. The report should reflect what the team *intends* to build for the following year and give a useful reference point for when the actual car is completed. For combustion engines, this will be a figure generated from the engine cc, for BEV, a figure will be given for motor KW, and battery KWh, and controllers an associated material/embedded CO₂ split. For other categories, such as hybrid or hydrogen, teams should present a detail split of materials and use the embedded CO₂ tables to calculate the figures.

Overall Management (40)
The teams will be judged on their proposed structure and how they plan to manage the project considering the costing of the vehicle and the understanding of the powertrain sustainability impacts.
Component Costing/Sustainability Embedded CO₂ (60)
The teams will be judged on the accuracy and quality of the vehicle chassis costing, understanding and demonstration of manufacturing processes used. They will also have to demonstrate how they have established the embedded CO ₂ for chosen powertrain, covering materials and associated manufacturing process where applicable.
Sustainability Analysis (50)
The teams must present in detail the reasoning behind their powertrain selection and how they balanced technical performance against ecological impact. They should cover alternatives such as combustions Vs. BEV, and pro and cons for a decision.
Total Points (150)

Teams are expected to produce a Sustainability Report detailing the embedded CO₂ for the chosen powertrain. This will be a final 10 minute presentation. The report should reflect what the team *intends* to build for the following year and give a useful reference point for when the actual car is completed. For combustion engines, this will be a figure generated from the engine cc. For BEV, a figure will be given for motor KW, battery KWh, associated controllers and material/embedded CO₂ split. Please use the 'MJ-Co2

Sust 1.0' table on the Documents page of the FS website. For other categories, such as hybrid or hydrogen, teams should present a detailed split of materials and use the embedded CO₂ tables to calculate the figures.

When the embedded CO₂ report is prepared any parts that will be manufactured and physically presented during judging should be entered using BLACK text. Any parts that will not be physically presented should be entered using RED text.

Points will be awarded according to the Class 2 Cost, Manufacturing and Sustainability Scoring Sheet. Team should aim to cover the following areas to achieve associated points.

No pre-event document submissions are required for the Cost, Manufacturing & Sustainability event. Therefore, there are no pre-event document submission penalties.

5. Business Logic Case

Class 2 teams must submit a Business Logic Case (BLC). The BLC is a simple document which enables the team to define their objectives in terms of a target vehicle cost, profitability of the company that will manufacture the car and performance targets for the design. This information is available for all the static event judges such that a consistent approach is presented by each team to all the static events. The BLC gives teams an opportunity to gain experience of constructing a Business Case for their chosen product. Full details on how to complete the BLC, the associated regulations and template can be found on the FS website.

Late submission or failure to submit the Business Logic Case will be penalised at the standard negative ten (-10) points per day to a maximum of negative fifty (-50) points. If the document is received more than five (5) days late it will be classified as "Not Submitted". For the avoidance of doubt the most recent version of any document submitted will be the submission evaluated for both lateness and quality.

6. Essential Information

In addition, Class 2 teams are required to submit Essential Information via your account (technical specification data, text about your team, concept and 1 image for the Event Programme). This can be a photo of the chassis, a computerised image of the chassis or car, a photo of the team or of the team logo.

Your Essential Information provides the basis of the material that the organisers print about each team in the Formula Student Event Programme and may be used by the organisers for pre-event PR, press releases etc. It will also be shown to the Business Presentation judges prior to the event, and is an opportunity to promote the team, university and car. As well as talking about the design choices you have made, and the key development features of your car, the text may also include how the team is organised, main objectives, etc.

Late submission or failure to submit the Essential Information will be penalised at the standard negative ten (-10) points per day to a maximum of negative fifty (-50) points. Teams must submit their Essential Information via their Team Account. After the deadline, teams will be given 14 days to upload any amendments before their account will not accept any further versions being uploaded.