



Dear Formula Student Competitor / Cost Captains

I appreciate that five pages of text is a lot to absorb. However, I believe this to be the best way to provide you the necessary guidance to effectively complete the Cost Event documentation for FSUK 18.

Please take a few minutes to read and fully absorb the following information, then feel free to ask any questions via the Formula Student Questions Database (FSQD) at: <http://teams.formulastudent.com/faq/FAQ.aspx>

Background

We have dramatically changed the way the Cost & Sustainability Event will run for Formula Student UK 2018. We have adopted the FSG methodology, with only a few minor differences and as a result any teams competing at either FSUK or FSG will have a minimum work to do, in order to make their cost packs compliant for either event.

I encourage you to **read carefully** both sets of rules and local rule sets, in order that your team will be compliant for either event's requirements. This is **your responsibility** and takes precedence over any additional information. This is particularly important in respect to the uploading your Cost Packs, but more on that later.

The New Format

Teams that have participated in previous FSUK events will know that for many years we have used the FSAE Cost Tables, which provided arbitrary costs for Raw Materials, Components, Manufacturing Processes and Tooling. Calculation using these costs then provided a Total Car Cost, with teams gaining additional points based on their positioning to the Lowest Cost Car.

Unfortunately, it has become evident that over the years, many teams have found ingenious ways and/or loopholes to 'massage' the Total Car Costs they presented at the event, which were significantly lower than a realistic cost for the prototype vehicle they bought to the events, in some cases by hundreds of thousands of euros !

Therefore, whilst one of the main changes for 2018 is that **NO POINTS** will be awarded for the Total Car Cost, we will still be evaluating your knowledge and understanding of realistic Cost Calculation and Cost Management methods for this type of project, together with your approach to decision making.

Your teams' ability to explain and justify your expenditure is now the most important factor in the Cost & Sustainability Judging Event, along with your understanding of the manufacturing processes you've used and other options that were available to you for this prototype vehicle – as well as your thoughts on alternative materials, processes or facilities that would be used should you move into a mass-production environment.

If you're team is well prepared and able to fully explain and justify these factors, they will do very well in the Cost & sustainability event at FS2018.

The Process

Although your team will not be judged on the Total Car Cost, the Cost Judges will still assess your ability to create a robust and complete Bill of Materials (BOM), with a sound understanding of the costing processes. These are valuable and vital skills for your future careers as professional Engineers. We aim to provide your team with an experience of this and test your knowledge at this years' Formula Student Event.

The 8 Vehicle Sub-sections remain the same as previous years:

1	Brakes	5	Miscellaneous, Fit, Finish & Assembly
2	Engine & Drivetrain	6	Steering System
3	Frame & Body	7	Suspension System
4	Electrical	8	Wheels, Wheel Bearings and Tyres

(Please Note: FS-AI entries **do not** require any Cost Packs for FSUK)

Key Requirements:

- For each of these Sub-sections we require a full parts list - clearly identifying with Part Numbers and Descriptions each Assembly, Sub-assembly and line-item Component used
- In addition, you should provide details / descriptions of the Materials, Fasteners, Manufacturing Processes and Tooling (*if appropriate*) used. This data linked to the point above will form your Bill of Materials (BOM)
- You will also need to specify which Assembly, Sub-assembly and line-item Component is either 'Bought-Out Finished' (BOF) - a *purchased part* – or manufactured in-house

I appreciate only too well, how many hours of work went into producing the cost packs for the previous FSUK events and we all believe that this new system will help simplify and reduce the burden for your team.

One of the most notable differences between FSG and FSUK, is that for FSG you are required to upload your Cost Packs to the FSG registration website, whereas, unfortunately this option or equivalent is not available to the IMechE at present.

However, to assist you even further, an (equally good) alternative tool - a Bespoke Excel Workbook that standardises and simplifies the uploading of your parts and process lists, has been single-handily created by **Konstantina Gouliermi** of the University of Patras (and a former FSUK/FSG competitor). My heartfelt thanks go to Konstantina Gouliermi for this excellent piece of work.

The FSG website has been transposed into an Excel Workbook format, so that it performs exactly the same function as the FSG website - but offline. This tool is to be downloaded from the FS webpage (<http://www.imeche.org/events/formula-student/team-information/forms-and-documents>) and used exclusively to submit your cost entry to FSUK.

Konstantina will also be one your cost judges this year, so if you want to thank her for her hard work when you see her at Silverstone please do so.

Unfortunately, those teams attending both FSG and FSUK will have to do a little extra work - a minor data entry exercise, transposing your data from this tool to the FSG website. As this should not take you too long, you will still see considerable time saved over previous years.

Instructions for use of this new tool are contained within the Excel Workbook, but you can also ask any questions via <http://teams.formulastudent.com/faq/FAQ.aspx> and we will do our best to answer them.

Part of the tool includes options to add costs to the Bill of Materials BOM. You will be aware, from the rules, that we also need you to provide us with a **Costed Bill of Materials** (CBOM) for two of the Vehicle Sub-sections.

For FSUK 2018, those Vehicle Sub-sections will be:

- **Frame & Body**
- **Suspension System**

We need you to provide full cost details of these two Vehicle Sub-sections, based on **actual costs incurred**.

For the cost of each relevant Manufacturing Process/Assembly operation employed, you should be prepared to:

- Present the cost calculations justifying the Hourly Rates you've used for Labour and Facility / Machinery Resources
- Explain the calculation methods you've used to justify the Facility/Machinery and Labour process times costed

Remember, we are not judging you on the Total Car Cost, so there is no need to present a cost lower than it actually is. We are looking for realistic estimates/costs. We are judging your understanding of 'Real Life' Cost Management - what your car would cost to produce in the real-world. We'll be judging your entry on the basis of whether the car represents good 'Value for Money'.

Don't forget, you'll also need to provide us with a Cost Explanation File/Pack – containing a full set of drawings (detailed later) and more importantly, all the assumptions you have used to cost your vehicle.

For example:

- What Labour Rates have you used and where have these come from? (options considered?)
- How many hours do you need to recover for Facilities/Machines & Labour? (basis of calculation?)
- What facilities, machinery, tools and equipment do you need to buy? (options considered?)
- How are these cost going to be recovered? (with in your part costs / depreciated - calculations?)
- What about cost of funding any loans to buy equipment?
- What about all the other overheads of running a business?

Remember that the Cost Judges do this every day for a living, so you need to invest some time to understand the subject and make your cost presentation as accurate and realistic as possible. If your logic and figures stand scrutiny, we will be happy.

Don't forget that you can ask any questions via <http://teams.formulastudent.com/faq/FAQ.aspx> and we will do our best to answer them – however, **be warned** though we will guide you, we will not give you absolute rates. That is part of the challenge we are giving you.

All costs for this event **MUST BE IN EUROS**. Please use a reasonable Exchange Rate and declare this in your Cost Explanation Pack, so the judges can easily understand your costs.

The Cost Explanation File is the document that helps the Cost Judges understand your vehicle, its construction and, where appropriate, your cost build-up. Whilst there is no page limit, the Cost Judges will only award marks where the information given is relevant and useful. If they have to search for this information in the middle of a lot of superfluous data, you could miss out on those points.

Drawings: You'll need to include a full set of dimensioned drawings (with part numbers) as for previous events and it's always useful to see exploded view diagrams to visualise the car and your processes better. How you deliver that within the constraints of this document is down to your own creativity, but we need all of your cost assumptions and it would be useful to list any equipment, machinery and tooling used in the production of your prototype. You may also wish to share photos of the production processes used if this adds value.

Please remember - this file must be uploaded as a PDF. It must be in A4 portrait format only.

You may insert drawings in a landscape orientation to maximise size and clarity, but the overall format of the main document must be portrait. Again, while there is no page limit - the upload limit for both documents is a maximum of 20MB. There should be no excuse in meeting this limit.

Please submit early so you have time to resolve any issues before the hard deadline. You also need to ensure the uploading of the completed Cost Tool (this includes your BOM & CBOM submissions) to your team accounts (Manage Submissions sections) by the date stated in the **Key Dates Document**.

Make sure that the document format is completely unchanged from the downloaded format. No matter how nice you think you could make it, we want a common format from all teams. Also, make sure you follow the correct naming protocol for saving the file (Team No._Uni Name_Cost Tool.xls)

To enable successful upload of the total cost submission, the two files need to be zipped into one file and that file uploaded to the teams account via 'Manage Submissions' on the FS website.

Note: the submission deadline has changed since the original publication of this key date's document (<https://www.imeche.org/events/formula-student/team-information/key-dates>). Always check this document and the version number of the document you are working from to ensure it is the latest version. In this new format - No addendums are permitted at the event. This is to make sure that all the latest revisions to your cars, after testing, have been included in your Cost Packs and cost updated where appropriate. We recognise for some this will still not be late enough, but the Cost Judges need time to review the documentation before the event and that will have to be a penalty that you will have to take I am afraid.

This should serve to make sure you finish your cars with more than enough time to test and fully modify them though so it could also be a good thing. If there are missing parts assemblies etc., there is a Schedule of Penalties in the rules so please get your car finished as soon as possible so you don't miss any elements out of your Cost Pack.

Class 2

For Class 2, everything remains the same as last year in principle. However, we also want you to use the new Excel workbook tool in place of the FSAE cost tables that were in use last year.

We only ask that you provide the judges with a cost plan for the Frame and Body (as previous events) and we want you to list your CBOM using the new Excel Workbook tool - providing a cost explanation file for review by the Judges.

We ask that you keep to the same formatting standard as in class 1, but there is no need to submit these in advance. You only need to bring hard copies to the event for your judges to talk through with you.

Don't forget that you can ask any questions via <http://teams.formulastudent.com/faq/FAQ.aspx> and we will do our best to answer them.

What happens next?

So, you have submitted all the required elements for the competition on time and have arrived at the event.

You need make sure of the following:

- You have used the 'Export to PDF' button and printed **at least** 1 hard copy of the Cost Tool (BOM/CBOM) and bound this in a ring binder/ folder (with divider tabs for ease of use with the Judges)
- You have also printed out at least 1 hard copy of the Cost Explanation File and again, bound this in a ring binder/ folder (with divider tabs for ease of use with the Judges)
- Make sure you are in the right place at the right time for your Cost Judging event, with your car (in a completed state and some tools available to release body work and provide reasonable access for the Judges)
- Make sure your **whole** team is briefed on the Cost Elements of the car - as any team member may be questioned on their basic understanding of the Cost Pack and its structure. For the more detailed areas of the Cost Presentation, the Team Leader or Team Cost Manager may be called upon for support

Please take time to focus on the Cost Packs and align your teams' way of thinking and approach to building a car that achieves a realistic and justifiable business case cost, rather than aiming for the absolute lowest cost.

One last point – make sure your whole team are well versed on prototype vs. mass production techniques and manufacturing processes. As you build your car, think about these differences and how you will justify them at the event.

I wish you all the best of luck with your Formula Student projects and the FSUK 2018 Cost Event and look forward to meeting you at Silverstone.

Best regards

John X Dangerfield

Head Cost Judge, FSUK