



Formula Student Spain 2021
2nd to 8th August

Formula Student Spain Rules 2021
Version 5.0

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CHANGELOG

Release	Date	Article	Modification
1.0	14/05/2021	NA	First release
2.0	18/06/2021	ES 4.1	Pre-ABF is no longer an important document
2.0	18/06/2021	ES 4.1	ABF deadline updated
2.0	18/06/2021	ES 4.1	TMD deadline updated
2.0	18/06/2021	ES 2.1	New requirements added
2.0	18/06/2021	ES 2.2	Circuit Access section Added
2.0	18/06/2021	ES 5.12	New Campsite Area Added
2.0	18/06/2021	ES 7.2.3	“Chassis and body” modified by “Suspension System”
2.0	18/06/2021	ES 7.2.4	“Steering System” modified by “Electrical System”
3.0	16/07/2021	ES 1.2.2	New Competition Dates added
3.0	16/07/2021	ES 1.6.1	Event handbook
3.0	16/07/2021	ES 2.1	COVID-19 section
3.0	16/07/2021	ES 2.2	Circuit Access
3.0	16/07/2021	ES 3.1.3	On-Site Team Registration Time
3.0	16/07/2021	ES 3.2	On-Site Team Registration
3.0	16/07/2021	ES 3.3	Dynamic vests deposit payment method added
3.0	16/07/2021	ES 3.5	Faculty advisor
3.0	16/07/2021	ES 4.1	Deadlines
3.0	16/07/2021	ES 5.7.1	Team briefing
3.0	16/07/2021	ES 5.12	Campsite area
3.0	16/07/2021	ES 7	Static events
3.0	16/07/2021	ES 8.9	“Driver limitations” Added
3.0	16/07/2021	ES 9.6	Transponder & Data logger deposit payment method added
3.0	16/07/2021	ES 9.7	Vehicle Status Video (VSV)
4.0	21/07/2021	ES 1.6.1	Event Handbook release date
4.0	21/07/2021	ES 2.1	COVID-19 section
4.0	21/07/2021	ES 2.2	Circuit Access
4.0	21/07/2021	ES 3.3	Dynamic Vests deposits payment
4.0	21/07/2021	ES 4.1	Deadlines
4.0	21/07/2021	ES 5.12	Campsite Payment

4.0	21/07/2021	ES 7	Static Events
4.0	21/07/2021	ES 7.2	Business Plan Presentation
4.0	21/07/2021	ES 7.3	Cost & Manufacturing Event
4.0	21/07/2021	ES 7.4	Engineering Design Event
4.0	21/07/2021	ES 9.6	Transponders & Data loggers deposits payment
5.0	28/07/2021	ES 5.12.7	Campsite Area (typo error)
5.0	28/07/2021	ES 7.1.1	Static events dates
5.0	28/07/2021	ES 1.6.1	FSS 2021 Handbook release date

LIST OF ABBREVIATIONS

AAIR	ASF Add Item Request
ABF	Accommodation Booking Form
ADR	Autonomous Design Report
ASF	Autonomous System Form
ASR	Autonomous System Responsible
ASRQ	ASR Qualification
BOM	Bill Of Material
BPES	Business Plan Executive Summary
BPP	Business Plan Presentation
CBOM	Costed Bill of Material
CRD	Cost Report Documents
CV	Combustion Vehicle
DBC	Database CAN
DBOM	Detailed Bill of Material
DSS	Design Spec Sheet
DV	Driverless Vehicle
EAIR	ESF Add Item Request
EDR	Engineering Design Report
ESF	Electrical System Form
ESO	Electrical System Officer
ESOQ	Electrical System Officer Qualification
ETC	Electronic Throttle Control
EV	Electric Vehicle
FSS	Formula Student Spain
FTO	Fuel Type Order
HIC	Health Insurance Card
IAD	Impact Attenuator Data
PreABF	Pre-Accommodation Booking Form
SE3D	Structural Equivalency 3D Mode
SES	Structural Equivalency Spreadsheet
SESA	SES Approval
TMD	Team Member Designation

ES 1 GENERAL INFORMATION

ES 1.1 FSS Competition

ES 1.1.1 Three competitions will be organized in Formula Student Spain 2021. These are for the Internal Combustion Engine Vehicle class (CV), the Electric Vehicle class (EV), and the Driverless Vehicle class (DV).

ES 1.1.2 Formula Student Spain 2021 Competition will comply with the **Formula Student Rules 2020**, which can be found in the following link:

<https://www.formulastudent.de/fsg/rules/>

ES 1.1.3 **Formula Student Spain Rules 2021** include some specific rule changes and additions. Those changes and additions are located within this document, which supersedes all other rules.

ES 1.1.4 Any questions or ambiguities concerning **Formula Student Spain Rules 2021** will be resolved by the Formula Student Spain Rules team.

ES 1.1.5 Specific rules-related questions should be sent by the team's captain via a contact form provided in the Competition website. Formula Student Spain Rules team will provide an answer via email.

ES 1.1.6 The officials reserve the right to revise the schedule of the competition and/or interpret or modify the competition rules at any time and in any manner that is, in their sole judgment, required for safe and efficient operation.

ES 1.1.7 Vehicles will be designated a vehicle number according to the following table:

	EV	CV	DV (EV)	DV (CV)
Vehicle numbers	001-199	201-399	401-499	501-599

ES 1.1.8 In case of Teams request a different vehicle number not according to the point ES 1.1.7, Formula Student Spain organization will decide if there will be exceptions or not.

ES 1.2 Competition Dates and Location

ES 1.2.1 Formula Student Spain 2021 will be held from Monday, 2nd until Sunday, 8th of August 2021. The event will take place at the Circuit de Barcelona-Catalunya, in Montmeló, Barcelona, Spain.

ES 1.2.2 Due to July 2021 Pandemic situation in Spain, Circuit of Barcelona-Catalunya Authorities and Spanish Governmental authorities decided that the best way to guarantee the health of the participants is to minimize the number of participants and days of competition. Due to this, the event will be split in 2 groups. First group, online events (final

dates pending to be announced on Wednesday, 21st) and second group, on-site events (dates will be from Wednesday, 4th until Sunday, 8th of August 2021). Original competition dates included in the previous point ES 1.2.1 are no longer valid.

ES 1.3 Competition Website

ES 1.3.1 The URL of the Formula Student Spain 2021 competition website is:
<http://www.formulastudent.es>

ES 1.4 Competition Official Time

ES 1.4.1 The Formula Student Spain official time will be:

From	Till	Time
29/03/2021	25/10/2021	CEST

The time of the competition is the official time for all deadlines and decisions.

ES 1.5 Competition Official Language

ES 1.5.1 Formula Student Spain 2021 official language is English only.

ES 1.6 Event Handbook

ES 1.6.1 The **FSS Event Handbook 2021** may contain schedule and other important information for the event. It must be read and understood by all event participants. It will be sent to the teams before July, 28th

ES 1.7 Official FSS2021 Awards

ES 1.7.1 Best overall teams of each class (EV/CV/DV) will be rewarded with an economic prize of 1.000€. They also:

- Will be invited for the next season event,
- Will not need to do the Registration Quiz.
- Will have a 50% discount on FSS21 registration.

ES 1.7.2 2nd overall teams of each class (EV/CV/DV) will be rewarded with an economic prize of 500€. They also:

- Will be invited for the next season event.
- Will not need to do the Registration Quiz.

ES 1.7.3 3rd overall teams of each class (EV/CV/DV) will be rewarded with a recognition trophy. They also:

- Will be invited teams for the next season event.
- Will not need to do the Registration Quiz.

ES 1.7.4 Extra Awards powered by Sponsors or FSS organization could be announced on the **FSS Event Handbook 2021**.

ES 2.1 COVID-19 Section

- ES 2.1.1 Due to the COVID-19 pandemic the actual execution of the event is subject to change. This document will be updated when new information or organisation changes are available.
- ES 2.1.2 Due to July 2021 Pandemic situation in Spain, Circuit of Barcelona-Catalunya Authorities and Spain Governmental authorities decided that the best way to guarantee the health of the participants is to minimize the number of participants and competition days. Due to this, all the static events will take place online (see ES 7)
- ES 2.1.3 Due to July 2021 Pandemic situation in Spain, Circuit of Barcelona-Catalunya Authorities and Spain Governmental authorities decided that the best way to guarantee the health of the participants is to minimize the number of participants and days of competition. Due to this, each team will be limited up to 8 participants.
- ES 2.1.4 Any team member apart from the participants detailed in article ES 2.1.3 will not be allowed to enter the circuit area including the campsite area and will not be allowed to work in any car part during the week of the event.
- ES 2.1.5 Mask wearing is compulsory both indoors and outdoors the Circuit.
- ES 2.1.6 Significant changes will apply to all sections (organisational, scheduling, and functional changes) to ensure team members and volunteers health (such as scrutineering, dynamic events and team briefings procedures).
- ES 2.1.7 The sections not mentioned in this release will be updated in further releases.
- ES 2.1.8 The competition area will be divided in isolated groups. The groups will be assigned to each team, according the COVID criteria defined by the organization.
- ES 2.1.9 Each group will be properly identified.
- ES 2.1.10 Each zone will have assigned an eating area (where the teams will be able to have their meals), a smoking area and restrooms.
- ES 2.1.11 The team members will not be allowed to use the areas from other zones they are assigned to.
- ES 2.1.12 The COVID Team Information questionnaire will be used to allocate the teams into the groups.
- ES 2.1.13 All the participants will have to present different documents and tests to be able to participate in the event.

These documents are:

- The vaccination certificate with the second dose applied at least 14 days prior to the event start or one dose and having past the COVID.
- If the team member comes from Spain and does not have the vaccination certificate with both doses, a negative PCR certificate done 24 hours prior the event start.
- If the team member comes from abroad and does not have the vaccination certificate with both doses, a negative PCR certificate done maximum 72 hours prior the event start.

ES 2.1.14 Due to July 2021 Pandemic situation in Spain, Circuit of Barcelona-Catalunya Authorities and Spain Governmental authorities together with FSS Organization, are tracking day by day the Pandemic situation. One of the important consequences is the campsite configuration. The current setup is defined with high COVID security measures and not yet approved by Local Sanitary authorities. There is the possibility of important changes on that topic. FSS Organization will keep informed to all the teams about it.

ES 2.1.15 A participant is considered fully dosed if:

- The participant got vaccinated with the second dose of Moderna/Pfizer/Astra Zeneca vaccine before 23rd of July (included).
- The participant got vaccinated with Janssen before 19th of July (included).
- The participant passed COVID-19 and got single-dosed vaccinated with Pfizer/Moderna/Astra Zeneca vaccine, before the 23rd of July (included).
- The participant passed COVID-19 and got single-dosed vaccinated with Janssen vaccine, before the 19th of July (included).

ES 2.1.16 To speed up payments during registration, it is highly recommended to do all the payments (campsite, transponder deposits, data logger deposits, etc) with the virtual payment method provided by the organization. Cash will be accepted in exceptional cases.

ES 2.2 **Circuit Access**

ES 2.2.1 Only the fully dosed vaccinated team members (see ES 2.1.15), team members without the fully dosed vaccinated (see ES 2.1.15) certificate coming from Spain with a negative PCR certificate done 24 hours prior the event start and team members without the fully dosed vaccinated (see ES 2.1.15) certificate from abroad with a negative PCR certificate done maximum 72 hours prior the event start will be allowed to enter

the Circuit area.

- ES 2.2.2 During the duration of event, no team member will be allowed to exit the Circuit Area.
- ES 2.2.3 If a team member needs to exit the circuit for some exceptional reason, he/she will have to have an official authorization from the FSS Organization.
- ES 2.2.4 The Organization will have an emergency service for the teams, with the purpose of purchasing goods for the team. This service will do a single trip each day, at 12:00h CEST.
- ES 2.2.5 No visitants will be allowed to enter the Circuit Area.

ES 3 EVENT REGISTRATION

ES 3.1 On-Site Team Registration Time

- ES 3.1.1 Teams will have a time slot for the on-site registration time.
- ES 3.1.2 To facilitate the registration process, teams must be present in the Registration Area one hour before their slot finishes.
- ES 3.1.3 FSS organisation will assign registration time slots to all the teams. These time slots will match the isolated groups to make sure that different groups respect COVID-19 physical restrictions.
- ES 3.1.4 Teams missing their slot will be reassigned by FSS Organization according to availability.

ES 3.2 On-Site Team Registration

- ES 3.2.1 Participating team members must be assigned prior to the competition. Team members can only be selected as participants by the team captain if they have submitted:

- HIC check.
- ABF
- TMD
- Driver license (only for drivers)
- ESO Qualification (only for ESO)
- ASR Qualification (only for ASR)
- COVID Certificate
- Self-responsibility document

- ES 3.2.2 A designated parking area next to the registration area will be assigned to each isolated group. The team must stay in their assigned area until they are registered.

- ES 3.2.3 To reduce the number of people in the registration area, only the team leader will be able to do the team registration on-site. The team members must wait next to the team vehicle in the assigned area.

ES 3.3 Dynamic Vests

- ES 3.3.1 Teams will need to pay a deposit amount to receive their Dynamic Vests. Teams which have made the payment will receive the dynamic vests at a specified time and location as it will be indicated in the **FSS Event Handbook 2021**.

- ES 3.3.2 The link to pay the deposits for Dynamic Vests will be (<https://www.stauto.org/formula-student-spain-2021-dynamic-media-vests-energy-meter-transponder/>). Cash will be accepted in exceptional

cases.

ES 3.3.3 The deposit for the dynamic vests will be returned through the same payment method than the participant did the payment.

ES 3.3.4 The dynamic vests deposit will be refunded if they are given back in the same conditions as they were delivered.

ES 3.4 **Driver/ASR/ESO Registration**

ES 3.4.1 Driver registration will take place at the Event Control, where they are required to show their valid driver's license and their student ID.

ES 3.4.2 ASR registration will take place at the Event Control, where they are required to show their valid ASRQ and their student ID.

ES 3.4.3 ESO registration will take place at the Event Control, where they are required to show their valid ESOQ and their student ID.

ES 3.5 **Faculty Advisor**

ES 3.5.1 Each team must have a Faculty Advisor appointed by the university. Due to the reduction of team members caused by the COVID-19 pandemic, this year it is not mandatory for the teams to bring the faculty advisor to the event.

ES 3.5.2 If the faculty advisor accompanies the team during the competition, he/she will be considered by the competition officials to be the official representative of the university and the responsible for the behaviour of all team members during the event.
The Faculty Advisor is expected to ensure that wherever possible the regulations are always followed, and their university's Health and Safety protocols are followed.

ES 3.5.3 If the Faculty Advisor is not present during the competition, the team captain will be considered by the competition officials to be the official representative of the university.

ES 3.5.4 Faculty Advisors may not design, build, or repair any part of the vehicle or directly participate in the development of any documentation or presentation.

ES 4 IMPORTANT DATES

ES 4.1 Deadlines

ES 4.1.1 All required documents and information must be uploaded to the competition intranet website by the team captain by the deadlines. The documents not listed in the table 1 are not required.

DATE	DESCRIPTION	CLASS
2021-05-30 13:00 CEST	Structural Equivalency Spreadsheet [SES]	ALL
2021-05-30 13:00 CEST	Structural Equivalency 3D Mode [SE3D]	ALL
2021-05-30 13:00 CEST	Electrical System Form [ESF]	EV
2020-05-30 13:00 CEST	Autonomous System Form [ASF]	DV
2021-06-06 13:00 CEST	Fuel Type Order [FTO]	CV
2021-06-13 13:00 CEST	Impact Attenuator Data [IAD]	ALL
2021-06-13 13:00 CEST	SES Approval [SESA]	ALL
2021-06-13 13:00 CEST	Autonomous Design Report [ADR]	DV
2021-06-13 13:00 CEST	Engineering Design Report [EDR]	ALL
2021-06-13 13:00 CEST	Design Spec Sheet [DSS]	ALL
2021-06-27 13:00 CEST	Team Member Designation [TMD]	ALL
2021-06-27 13:00 CEST	Accommodation Booking Form [ABF]	ALL
2021-06-27 13:00 CEST	Business Plan Pitch Video [BPPV]	ALL
2021-06-27 13:00 CEST	Business Plan Executive Summary [BPES]	ALL
2021-06-27 13:00 CEST	ESO Qualification [ESOQ]	EV
2021-06-27 13:00 CEST	ASR Qualification [ASRQ]	DV
2021-07-08 13:00 CEST	Vehicle Status Video [VSV]	ALL
2021-07-15 13:00 CEST	Cost Report Documents [CRD]	ALL
2021-07-22 13:00 CEST	Final DBC file upload [DBC]	DV
2021-07-24 13:00 CEST	Final Team Member Designation [FTMD]	ALL
2021-07-24 13:00 CEST	COVID Certificate	ALL
04-08-2021 ON SITE	Self-responsibility document	ALL

Table 1 - Document deadlines.

ES 4.1.2 Due to the current situation regarding the Covid-19 the organisation will

manage specific document deadlines with teams for specific cases. More information regarding the Covid-19 situation will be published on the FSS website.

ES 4.1.3 The FSS Intranet will be available since May 16th. More information regarding the FSS Intranet login will be sent to the teams via email.

ES 4.1.4 Due to July 2021 Pandemic situation in Spain, FSS Organization will need to present on July, 24th the detailed information included in the TMD to the local health authorities. Therefore, Teams will have to upload a new Important document (Final Team Member Designation [FTMD]) before the July 24th. Only the teams, who present this document on time, will be allowed to participate in the Event.

ES 4.1.5 A new important document is required by the Circuit Responsible and Local Health authorities to ensure the safety of the event. The teams must present the COVID-19 Certificate on 24th of July through the FSS intranet. All the team participants who have the certificate will need to upload it on a single document after the uploaded template. Only the teams, who present this document on time, will be allowed to participate in the Event. If a team does not have any vaccinated team member, the team must upload the filled PDF template provided on the intranet.

ES 4.2 **Document Size & Formatting**

ES 4.2.1 All documents must comply with a maximum size of 50 MB.

ES 4.2.2 All documents must be submitted following the nomenclature below:

CAR#_TeamName_YYMMDD_DocumentAbbreviation

Where YYMMDD is the date in Year/Month/Day format.

For instance, the Engineering Design Report must be named:

121_RacingTeam_200317_EDR

ES 4.2.3 The documents for Cost & Manufacturing event [BOM, CBOM and DBOM] must be zipped in one archive. The Cost Report Explanation file and Supporting material should be zipped together with BOM documents.

ES 4.2.4 It is allowed to use other Formula Student event templates for the documents which a template is not uploaded in the intranet.

ES 5 COMPETITION SITE ORGANISATION

ES 5.1 Competition Site

ES 5.1.1 The use of quads, bicycles, motorcycles, scooters, skateboards, or other similar mobility devices as well as self-propelled devices in general by team members on competition site is prohibited.

ES 5.1.2 Smoking is strictly prohibited in the Dynamic Area, all buildings, and the Pit Area. Smoking areas will be defined in the **FSS Event Handbook 2021**.

ES 5.1.3 No open fires are allowed in the Pit Area as. This includes BBQ grilles, oxy-acetylene torches, heaters, etc.

ES 5.2 Welding

ES 5.2.1 FSS does not provide a welding service for teams.

ES 5.2.2 Welding with own equipment will be possible in the welding area at specific times as indicated by the **FSS Event Handbook 2021**. Teams must use the appropriate safety gear.

ES 5.3 Tires

ES 5.3.1 FSS does not provide a tire changing service.

ES 5.4 Fuel Station

ES 5.4.1 Open fuel containers are not permitted at the event.

ES 5.4.2 All fuel containers must be DOT approved.

ES 5.4.3 Refuelling is only allowed at the fuel station.

ES 5.4.4 Waste oil must be taken in the corresponding area as it will be indicated in the **FSS Event Handbook 2021**.

ES 5.5 **Charging Area**

ES 5.5.1 The power available on each charging point will be shared by 2 charging stations. Each charging point will have a maximum of 12.8 kW output.

The available power sockets on each charging point are:
3 DIN sockets, 2PE, 230V, 16A.
2 CEE socket, 3PNE, 400V, 16A, 5-pole.
1 CEE socket, 3PNE, 400V, 32A, 5-pole.

ES 5.5.2 If a team needs to charge with the 400V–32A CEE socket, it should be specified when requesting the charging slot.

ES 5.5.3 Each team could request a maximum of 4 charging slots per day. Each charging slot allows half an hour access to a charging point.

ES 5.5.4 Inside the charging area, team members must not wear any conductive jewellery or objects of any kind which could touch the accumulator.

ES 5.5.5 Only three members per team may enter the charging area at the same time. One of them must be the Electrical System Officer (ESO) or the Autonomous System Responsible (ASR), respectively.

ES 5.6 **[CV ONLY] Engine Test Area**

ES 5.6.1 Engines may only be run in the designated engine test area during the opening times and only after passing the tilt test.

ES 5.7 **Team Briefing**

ES 5.7.1 Only the team leaders and drivers will be allowed to participate in the briefings. Drivers who have not attended a briefing cannot participate at the dynamic events of this specific day.

ES 5.7.2 [EV ONLY] All ESOs that are planning to take part in a dynamic event of a specific day must attend the team briefing of this specific day. ESOs who have not attended a briefing cannot participate at the dynamic events of this specific day.

ES 5.7.3 [EV ONLY] If a team wants to participate in the dynamic events of a specific day, at least one ESO must attend the team briefing.

- ES 5.7.4 [DV ONLY] All ASRs that are planning to take part in a dynamic event of a specific day must attend the team briefing of this specific day. ASRs who have not attended a briefing cannot participate at the dynamic events of this specific day.
- ES 5.7.5 [DV ONLY] If a team wants to participate in the dynamic events of a specific day, at least one ASR must attend the team briefing.
- ES 5.7.6 Team captains must attend all the team briefings. Team captains not attending the briefings will be penalized and the team will not be able to run any dynamic event of that specific day.
- ES 5.7.7 An identification system will be implemented to check the attendance of team representatives: team captains, ESOs, ASRs and Drivers on each team briefing.
- ES 5.8 Drone Prohibition**
- ES 5.8.1 Flying an unmanned aircraft or drone at the event site (Circuit de Barcelona – Catalunya) is strictly prohibited.
- ES 5.9 Removing the Vehicle from the Site**
- ES 5.9.1 All teams who remove their vehicle from the competition site after the competition has begun will be disqualified from the competition. This applies to all classes, including the removal of the tractive system accumulator in EV and DV classes.
- ES 5.10 Driving under power outside Dynamic Areas**
- ES 5.10.1 Teams driving their vehicles in non-dynamic areas will be penalized in the current edition as well as in future editions.
- ES 5.11 Material Losses**
- ES 5.11.1 Stealing or causing material damage on alien materials or belongings is strictly prohibited. This includes all the assets, materials, or belongings from the FSS organization, the venue, the FSS Sponsors, any participating team or any visitor.
- ES 5.11.2 If it is proved that a team has stolen or caused any material damage in any of the above-mentioned cases, it will be penalized in the current competition as well as in future competitions.

ES 5.12 Campsite Area

- ES 5.12.1 The campsite area is the dedicated space for the teams to have their meals.
- ES 5.12.2 All the team members must sleep at the campsite area.
- ES 5.12.3 Each team will have a defined area to have their tents, as well as the cooking tents.
- ES 5.12.4 The teams must bring small tents (4 people maximum).
- ES 5.12.5 The campsite area will be divided in the same zones as the competition site, following article ES 2.1.6.
- ES 5.12.6 The teams will not be allowed to change their sleeping areas.
- ES 5.12.7 The Campsite Fee is 90€ for each participant in case of early bird booking (before July, 28th, 2021) or 110€ for each participant (after July, 28th, 2021) This includes from Wednesday, 4th, August 2021 to Monday, 9th August, 2021 (before 13H CET)). The link to pay the deposits for the Campsite will be (<https://www.stauto.org/formula-student-spain-2021-campsite-payment/>). Cash will be accepted in exceptional cases.
- ES 5.12.8 If there was any change regarding the campsite area, the organization will inform the teams.

ES 6 TECHNICAL INSPECTION

ES 6.1 Pre-Inspection

ES 6.1.1 Pre-inspection will be conducted in the pit, where the technical inspectors will visit the teams according to the order published on the **FSS Event Handbook 2021**.

ES 6.1.2 A team which is not present or ready at the first visit must contact the technical inspectors in the pit for a new appointment.

ES 6.1.3 Pre-inspection must be completed latest before the tilt test.

ES 7 STATIC EVENTS

ES 7.1.1 Due to the COVID-19 pandemic, this year all the static events (Design Event, Cost & Manufacturing Event and Business Plan Presentation) will take place online. Static events will be scheduled from the 26th of July to the 6th of August. A detailed time schedule will be sent on the 24th of July and all the further updates will be send by email to all the teams.

No Finals will take place this year for all the 3 events of Static Events.

ES 7.1.2 Each team will be provided with one Zoom link to perform all the static events. Only team members can attend the static events, and a list of all the team members assisting to the event must be shared with the moderator. Sharing links with other teams will result to a 50 points penalty to both teams.

Each static event will have a moderator. The teams shall connect to the zoom meeting 5 to 10 minutes before the start. The moderator will ensure the connection is good and the Team Members are connected.

ES 7.2 Business Plan Presentation

ES 7.2.1 The Business Plan Presentation event will comply with article **S 1** of **Formula Student Rules 2021**. Nevertheless, specific changes are included in this section for FSS 2021 event.

ES 7.2.2 Teams are required to submit two documents before the competition: The Business Plan Executive Summary and the Business Plan Pitch Video.

ES 7.2.3 The Business Plan Executive Summary should contain a brief description of the team's Business Plan. The Business Plan Executive Summary must not exceed one page. Any portions of the Executive Summary that exceeds one page will not be evaluated.

Furthermore, at FSS judges give a lot of importance to the financial aspects of the business plan. Teams are advised to include financial information in their executive summary, e.g., Profit & Loss Statement, Balance Sheet, Cash Flow, R&D Expenses, Material Fixed Assets, among others.

ES 7.2.4 The Business Plan Pitch Video should be considered the first impression of the business idea and must contain the relevant investment figures. The objective is to convince the potential investors or partners that the team's presentation is worthy of their time.

The Business Plan Pitch Video must not exceed a length of 30 seconds and must be in a common video format, e.g. .avi, .mpg, .mp4, .wmv.

ES 7.2.5 At Formula Student Spain 2021 the Business Plan Presentation judging will consist of three parts:

- I. Initial judging of all teams.
- II. The judges will rank the best Business plans regardless of the vehicle type.
- III. From the ranked list, the judges will take the top 3 of each vehicle type (CV; EV; DV).

ES 7.2.6 **Formula Student Rules 2020** article **S 1.4** is excluded for FSS competition.

ES 7.2.7 The Business Plan Presentation will be evaluated on the categories specified in the following table:

Category	Points
Content	20
Organisation	10
Visual Aid	10
Delivery	10
Questions	15
Executive Summary	10
Deep Dive Topic	10
Total	85

Table 2 - Business Plan Presentation Scoring.

ES 7.2.8 The scoring of the BPP is based on the average of the scores given by each of the judges. The scoring for the non-finalists can be a maximum of 70 points. The scoring of the BPP finalists will vary from 75 to 71 points and is scored by all BPP judges.

ES 7.2.9 The scoring for the non-finalists can be a maximum of 70 points and is calculated as follows:

$$\text{Business Plan Score} = 70 \left(\frac{P_{Team}}{P_{Max}} \right)$$

P_{Team} is the score awarded to the team.

P_{Max} is the highest score awarded to any team not participating in the finals.

A penalty of 50 points will be applied to the overall team's competition score if it does not attend their Business Plan Presentation time slot. No penalty will be applied if the team informs the organisation that it will not be able to take part on its Business Plan Presentation time slot 2 days before the assigned slot.

ES 7.2.10 Business presentation will take place the 26th and 27th of July. Teams taking other FS events during these days and cannot participate in the Business Plan presentation, should contact the FSS organization to agree an additional timeslot before FSS Starts.

ES 7.2.11 Specific Online rules for business:
- The team must be 5 minutes in advance of the proposed timeslot connected ready to start.

ES 7.3 **Cost & Manufacturing Event**

ES 7.3.1 FSS 2021 Cost & Manufacturing Event will comply with the **Formula Student Rules 2020** except for the following rule changes.

ES 7.3.2 The BOM, DBOM and CBOM must be created following the FSS 2021 Excel templates provided to the teams by the FSS organisation. Furthermore, FSS will accept BOM, DBOM and CBOM which have been created with FSG or FSUK templates if teams put the appropriate car number for that team in FSS competition.

ES 7.3.3 For FSS 2021 a DBOM (see article **S 2.5** from **Formula Student Rules 2020**) for the “Suspension System” must be submitted.

ES 7.3.4 For FSS 2021 a CBOM (see article **S 2.6** from **Formula Student Rules 2020**) for the “Electrical System” must be submitted.

ES 7.3.5 At FSS 2021, the cost and manufacturing Event will consist of two steps:
I- Initial judging of all teams.
II- The judges will rank the top 3 of each vehicle type (CV; EV; DV).

ES 7.3.6 The scoring will comply with article **S 2.10.4** from **Formula Student Rules 2020** with the difference that teams will be ranked together, no matter what their vehicle class are.

ES 7.3.7 The scoring of the cost and manufacturing finalists will vary from 100 to 97 points.

ES 7.3.8 A penalty of 50 points will be applied to the overall team’s competition score if it does not attend their Cost & Manufacturing time slot. No penalty will be applied if the team informs the organisation that it will not be able to take part on its Cost & Manufacturing time slot 2 days before the assigned slot.

ES 7.4 **Engineering Design Event**

ES 7.4.1 The engineering design event complies with the **Formula Student Rules 2020** article **S 3**, except for the following changes which

supersede the prior.

- ES 7.4.2 CV, EV and DV will each have a separate engineering design event.
- ES 7.4.3 The overall engineering design event maximum scoring is 150 points for CV/EV and 300 points for DV.
- ES 7.4.4 [DV ONLY] The Autonomous Design Report (ADR) does not necessarily need to be written as a scientific paper. Hence, article **S 3.4.6** from **Formula Student Rules 2020** is no longer valid.
- ES 7.4.5 [EV Only] Due to the fact that the event will take place online, the rule S3.5.6 will not be applied.
- ES 7.4.6 The time duration for the CV and EV Engineering Design Event will be 50 minutes.
- ES 7.4.7 [DV Only] The time duration for DV Engineering Design Event will be 50 minutes.
- ES 7.4.8 The maximum scores listed in the following table apply for the engineering design event of CV, EV and DV Hence, article **S 3.8.2** from **Formula Student Rules 2020** is no longer valid.

Category	Area	Points	Total
CV, EV & DV Vehicle Evaluation	Engineering Design Report (EDR)	10	150
	Aerodynamics & Cooling	25 (15)	
	Electronics	20	
	Powertrain	25 (30)	
	Structural	25	
	Technical Management	20	
	Vehicle Dynamics & Suspension	25 (30)	
DV Autonomous Evaluation	Autonomous Design Report (ADR)	15	150
	Hardware Development	10	
	Software Development	10	
	Planning	20	
	Localization & Mapping	20	
	Sensor Data Interpretation	20	
	Safety & Security	10	
	Vehicle Networking / Data Processing	15	
	Validation, Simulation & Testing	15	
Data Visualization	15		

Table 3 - Engineering Design Scoring.

Note: Scoring within brackets supersedes if there is no aerodynamic package.

- ES 7.4.9 Due to the COVID restrictions, there will be no finals.

- ES 7.4.10 A penalty of 50 points will be applied to the overall team's competition score if it does not attend their Engineering Design event time slot. No penalty will be applied if the team informs the organisation that it will not be able to take part on its Engineering Design event time slot 2 days before the assigned slot.
- ES 7.4.11 Specific Online rules for the Design event:
- Teams must be 5-10 minutes in advance of the proposed timeslot connected ready to start.
 - 5-minute presentation including 5 minutes Vehicle 3D/Photo/Video overall explanation.
 - 45-minute Q&A (By areas expertise separately).
 - Feedback will be provided later by written report.

ES 8 DYNAMIC EVENTS

ES 8.1 Dynamic Events General Considerations

- ES 8.1.1 Practice tracks are also considered dynamic areas.
- ES 8.1.2 No tents, pavilions, tarps, and brooms are allowed in dynamic areas. Only handheld umbrellas are allowed.
- ES 8.1.3 “Ready to Race” means entering the area after inspection with driver belted, car adjustments done, cameras on, no tyre protections, tyres cleaned (if needed), etc. Vehicles which are not in “Ready to Race” conditions will be sent back to the end of the queue.
- ES 8.1.4 “Ready to Race” area will close at the Event End Time indicated at the event entrance. Only cars that are inside the “Ready to Race” area will be allowed to start the event after the Event End Time.
- ES 8.1.5 Cars inside the “Ready to Race” area at the Event End Time can make two runs only if the driver decides to do the second run immediately after its first run.
- ES 8.1.6 Tool carts are not allowed after the inspection area.
- ES 8.1.7 After any run, the driver must leave the course and drive slowly back to the start line for the second run, to the driver change area or to the exit lane.

ES 8.2 Dynamic Events Duration

- ES 8.2.1 The event duration for Skidpad, Acceleration and Autocross will be determined by the number of teams that have passed the technical inspection.
- ES 8.2.2 The Event Start Time will be published in the **FSS Event Handbook 2021**. The preliminary Event End Time will be notified by the organization to the teams in the Team Briefing of the event day.
- ES 8.2.3 The Event End time may be updated during the event if the number of cars that passed the technical inspection increases. Updates will never shorten the actual Event End Time

ES 8.3 [EV & CV ONLY] Acceleration Event

- ES 8.3.1 The acceleration event will be performed after sunset, therefore with no sunlight. FSS organisation will provide appropriate external lighting equipment to have a safe event.
- ES 8.3.2 FSS organisation recommends teams to use night helmet visors to ensure good visibility during the event.
- ES 8.3.3 Teams will be allowed to mount lights on the vehicle just for this dynamic event provided that the following requirements are achieved:
- Lights and its wiring must be securely attached to the vehicle.
 - Lights should not be attached to the roll hoop or main hoop.
 - Lights should be supplied from the LVS system or an auxiliary supply system.
 - Acceleration Event Pre-Inspection and Post-Inspection will verify the security of the lights and its wiring.
- ES 8.3.4 [EV ONLY] If a team obtains the LVS supply from the TS system an additional auxiliary supply system must be mounted on the vehicle to provide the supply for the lights. This applies to teams that only plan to mount the lights during the Acceleration event.
- ES 8.3.5 [EV ONLY] If a team obtains the LVS supply from the TS System and cannot mount an auxiliary supply system will need to mount the lights throughout the event and pass all the stages of the technical inspection.
- ES 8.3.6 Special equipment may be used to notify each driver of the start of a run, instead of using a green flag.

ES 8.4 Autocross Event

- ES 8.4.1 There will be a course walk prior to the Autocross Event start, which will be mandatory for all teams competing in the Autocross Event.
- ES 8.4.2 The time to perform this course walk will be limited and it will be informed during the event briefings.
- ES 8.4.3 Failure to obey this course walk time limitation could end up in a penalization at the discretion of the officials.
- ES 8.4.4 The organization will clarify which equipment is allowed to use during the autocross track walk on that day's team briefing.

ES 8.5 Endurance Event

- ES 8.5.1 There will be a course walk prior to the Endurance Event start.
- ES 8.5.2 The time to perform this course walk will be limited and it will be informed during the Event briefings.
- ES 8.5.3 Failure to obey this course walk time limitation could end up in a penalization at the discretion of the officials.
- ES 8.5.4 The organization will clarify which equipment it is allowed to be used during the endurance track walk on that day's team briefing.

ES 8.6 Endurance Running Order

- ES 8.6.1 The Endurance Running Order will be published the day before the Endurance event.
- ES 8.6.2 The Running Order will be classified in three different rounds per each isolated group: slow, fast, and final. Rounds will start with the slowest vehicle and end with the fastest vehicle that take part of each round.
- ES 8.6.3 The number of teams that will run in each round will be notified in the Teams Briefing.
- ES 8.6.4 Teams that rated DNF or have not run the Autocross event will be considered the slowest vehicles and will run at the beginning of the slow round.
- ES 8.6.5 Teams must visit the Endurance Team Order Tool to know when they must attend the Endurance Entrance. This tool is updated in real time so that teams will be able to always know in which queue position they are. Further information about the Endurance Team Order Tool and how to access to it will be published in the Event Handbook.
- ES 8.6.6 Teams must be present at the Endurance Entrance when they are in the Upcoming Teams status. This means they can be picked to get into the Endurance Queue area at any moment.
- ES 8.6.7 The first 6 teams will get into the Upcoming Teams status automatically. This means they must attend the Endurance Entrance at the Event Start Time. The teams will enter the Endurance Queue area and will be allowed to prepare the car to "ready to Race" status.
- ES 8.6.8 The team must inform the Scrutineers when the car is in "Ready to Race" Status. Scrutineers will tell the team when the car can proceed to the Inspection Area.

ES 8.6.9 If a team in Upcoming Teams status is not present when the Marshall tries to inform them to proceed to the entrance, this team will be rescheduled after the end of its own round and a penalty of 120 seconds will be applied.

ES 8.6.10 Teams running later will be ordered according to the Autocross results.

ES 8.6.11 Teams must attend the Endurance in the scheduled session. The session is concluded when the last team with no penalties ends the Endurance.

ES 8.7 **[DV ONLY] Driverless Dynamic Events**

ES 8.7.1 Rules regarding Driverless Dynamic track marking are based on the **FSG Competition Handbook 2021** article **DE 6.3**. Nevertheless, specific changes are included in this section for FSS 2021 event.

ES 8.7.2 The markings of all dynamic events will have the following characteristics:

- The track is marked with cones.
- The left borders of the track are marked with small blue cones.
- The right borders of the track are marked with small yellow cones.
- Exit and entry lanes are marked with small orange cones.
- Big orange cones will be placed before and after start, finish, and timekeeping lines.
- If not defined otherwise in chapter D of the rules, the maximum distance between two cones in driving direction is 5 m. In corners, the distance between the cones is smaller for a better indication.
- There are no track limits lines for acceleration and Emergency Brake System (EBS)-test.

ES 8.7.3 All lines may be spray painted or painted with chalk.

ES 8.7.4 The cones used at the competition are equal to the cones listed in the table below:





			
Big orange cone Two white strips WEMAS 307.610500.00.00	Small orange cone Single white strip WEMAS 400.000013. 00.00	Small yellow cone Single black strip WEMAS 400.000013.01. 10	Small blue cone Single white strip WEMAS 400.000043. 00.00
285mm x 285mm x 505mm 1.05 kg	228mm x 228mm x 325mm 0.45 kg		

Table 4. Cones specifications

ES 8.7.5 The manufacturer WEMAS (<https://www.wemas.de>) does not sell the cones to end customers, but they may be purchased from baustellenabsicherung24.de (<https://baustellenabsicherung24.de/leitkegel-titan-180-1934.html>).

ES 8.7.6 There are the following limitations mainly resulting from the track conditions and organizational/authorization issues:

- The lines may not be perfectly and continuously drawn.
- There may be further markings, to those mentioned above, that are not part of the track (e.g., markings, including cone position markings, lines from other events or different coloured surface, etc.) on or close to the track which will not be removed by the officials.
- There may be (stacked) spare cones standing at the trackside at distinguishable distance.
- No special artificial landmarks are provided by officials. The team must not place additional landmarks on the track or inside the dynamic area.
- No map data is provided by the officials.

ES 8.7.7 Figures 1, 2 and 3 visualize the track layout descriptions given in **Formula Student Rules 2020** articles **D 4.3**, **D 5.1**, and **D 8.1**.

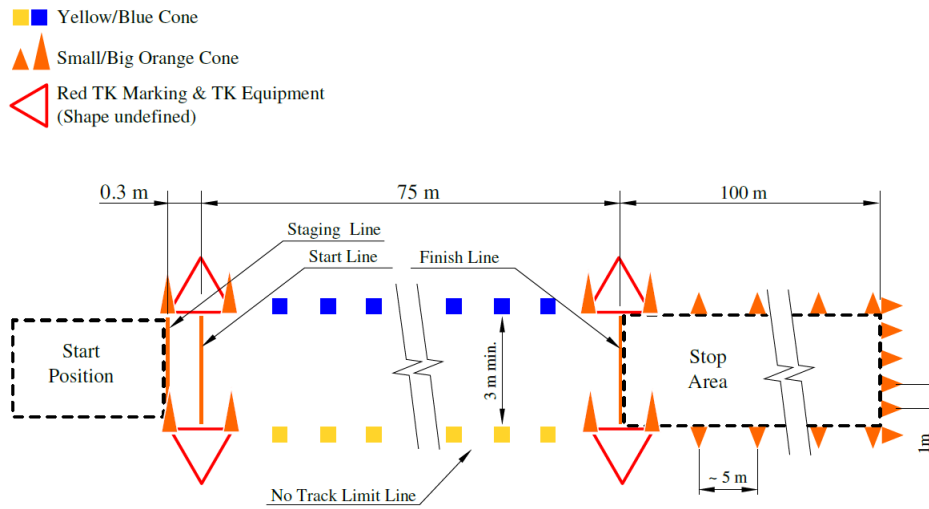


Figure 1: Acceleration

- Yellow/Blue Cone
- ▲ Small/Big Orange Cone
- ◁ ▷ Red TK Marking & TK Equipment (Shape undefined)

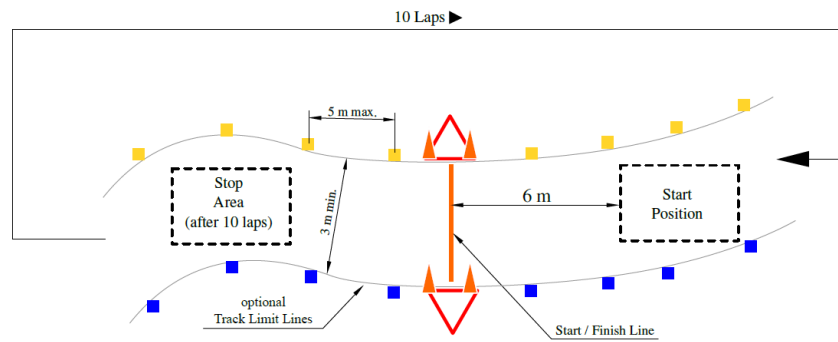


Figure 2: Track drive

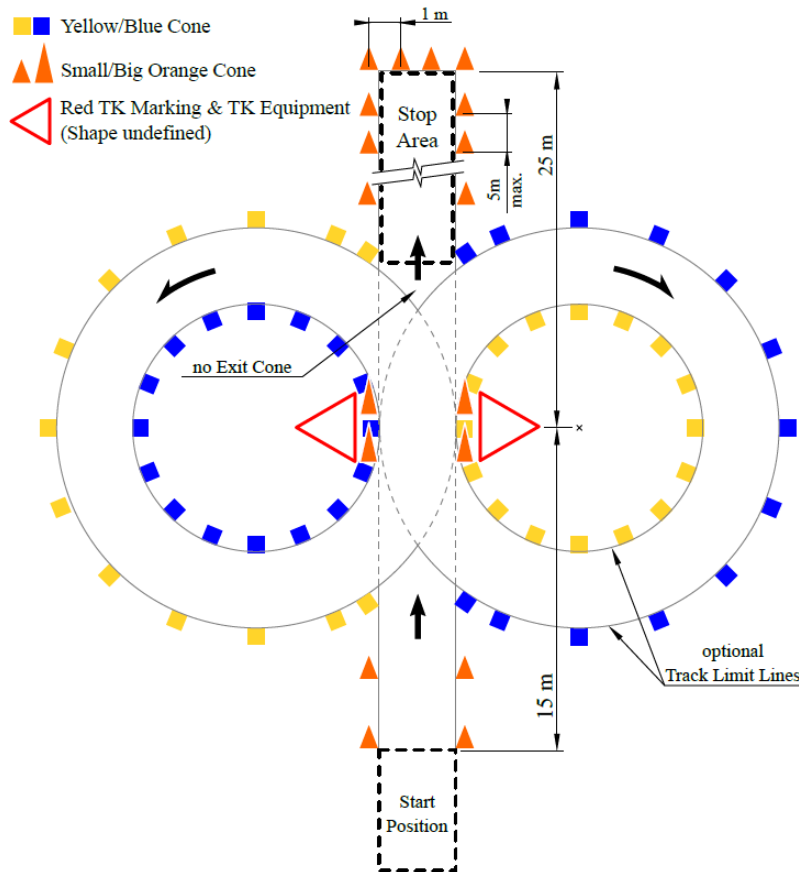


Figure3: Skid pad base configuration.

ES 8.7.8 The final position of the cones may not correspond exactly to the figures 1, 2 and 3.

ES 8.8 Dynamic Event Penalties

ES 8.8.1 The penalties applied to teams will follow **Formula Student Rules 2020**, although officials have the right to perform modifications to the rules as stated in **Formula Student Spain Rules 2021** article **ES 1.1.6**.

ES 8.8.2 Teams will be penalised if during a dynamic event they intend to communicate or make a verbal complaint to any official controlling the dynamic event or the timekeeping staff. The final penalty will be decided at the discretion of the officials.

ES 8.8.3 Teams will be penalised if team members inside the dynamic area of a dynamic event don't follow the instructions of the officials, marshals, or other organisation staff. This includes team members with a Media vest inside the dynamic area, which must follow the instructions of the FSS staff to guarantee the event safety. The final penalty will be decided at the discretion of the officials.

ES 8.9 Driver Limitations

ES 8.9.1 In total, a minimum of two and a maximum of four drivers will be allowed for each team.

ES 8.9.2 [DV ONLY] DV teams need to register at least one driver for manual brake test but may register up to three drivers for testing in manual mode.

ES 9 VEHICLE REQUIREMENTS AND RESTRICTIONS

ES 9.1 Technical Inspection Sticker

ES 9.1.1 For the competition technical inspection sticker, a space 50 mm tall x 180 mm wide must be made available on the nose of the vehicle directly in front of the cockpit opening.

ES 9.2 [EV ONLY] Cell Temperature Monitoring Device (CTMD)

ES 9.2.1 At FSS articles **EV 5.8.5** and **IN 3.1.2** of the **Formula Student Rules 2020** will not be applied.

ES 9.3 [EV & DV ONLY] Data Logger

ES 9.3.1 A Data Logger will be used and provided by the officials as an official measuring system according to **Formula Student Rules 2020** articles **EV 4.6** and **DV 1.3**.

ES 9.3.2 At FSS article **DE 7.3** of the **FSG Competition Handbook 2021** will be applied.

ES 9.4 [DV ONLY] Remote Emergency System (RES)

ES 9.4.1 At FSS article **DE 7.4** of the **FSG Competition Handbook 2021** will be applied, except for article **DE 7.4.3**.

ES 9.5 Transponders / Timekeeping

ES 9.5.1 The **FSS Event Handbook 2021** will provide further information regarding the allowed mounting position and orientation to mount the transponder.

ES 9.5.2 Live timing is provided at <https://www.formulastudent.es>. The shown data is unofficial.

ES 9.6 Transponder & Data Logger Deposits

ES 9.6.1 Teams will need to pay a deposit amount to receive their transponder. Teams which have made the payment will be delivered the transponder at a specified time and location as it will be indicated in the Event Handbook.

ES 9.6.2 The link to pay the deposits for the transponders and data loggers will be (<https://www.stauto.org/formula-student-spain-2021-dynamic-media-vests-energy-meter-transponder/>). Cash will be accepted in exceptional cases.

ES 9.6.3 [EV & DV ONLY] Teams will need to pay a deposit amount for the data

logger. Teams which have made the payment will be delivered the data logger at a specified time and location as it will be indicated in the **FSS Event Handbook 2021**.

ES 9.6.4 The transponder and data logger will be returned at a specified time and location as it will be indicated in the **FSS Event Handbook 2021**.

ES 9.6.5 The deposit for the transponders and data loggers will be returned through the same payment method than the participant did the payment.

ES 9.6.6 The transponder and data logger deposits will be refunded if they are returned in the same conditions as in the delivery moment.

ES 9.7 **Vehicle Status Video (VSV)**

ES 9.7.1 All teams must upload a video showing the vehicle driving prior to the competition. The video must comply with **Formula Student Rules 2020** article **A 5.6**.

ES 9.7.2 Those teams who are not able to present the VSV before the deadline will not be able to participate in the competition.

ES 9.7.3 The VSV must be uploaded before the deadline specified in article ES 4.1 of the **Formula Student Spain Rules 2021**.

ES 9.7.4 The FSS Organization will study individually the cases in which the video uploaded by the team does not fulfil article **A 5.6** in **Formula Student Rules 2020**. It also reserves the right to decide whether the team can compete.

ES 9.7.5 In the case that a team does not accepted the decision of the FSS Organization related to articles **ES 8.7.3** and **ES 8.7.4** of **Formula Student Spain Rules 2021**, the team will be de-registered and the inscription to the event will not be refunded.

ES 10 SCORING

ES 10.1 Static and Dynamic Events Scoring

ES 10.1.1 The scoring of both Static and Dynamic events will comply with **Formula Student Rules 2020**, except for the specific changes of **Formula Student Spain Rules 2021** as presented in articles **ES 7** and **ES 8**.

ES 10.2 Scoring Publication

ES 10.2.1 The scoring of both static and dynamic events will be published during the competition in the Event Control and in the FSS website.

ES 10.2.2 Publication times will be presented in the **FSS Event Handbook 2021** and during the competition briefings.

ES 10.3 Scoring Penalties

ES 10.3.1 The penalties applied to teams will follow **Formula Student Rules 2020**, although officials have the right to perform modifications to the rules as stated in article **ES 1.1.6** of **Formula Student Spain Rules 2021**.

ES 10.4 Scoring Complaint Procedure

ES 10.4.1 Teams will have one hour to submit a scoring complaint for a static or a dynamic event from the event scoring publication.

ES 10.4.2 If the complaint does not proceed, the team will receive a 25 points penalty.