

FORMULA STUDENT

PORTUGAL



**EVENT
HANDBOOK
2024**

Bishop's Palace Garden - Castelo Branco

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Changelog

Rule	Version	Date	Change
All	1.00	07/01/2024	First release.
SC chapter PT 6.4.3 PT 6.6.2 PT 2.9.2 PT 11.3	1.01	29/02/2024	Added Senior Cup chapter, clarified rule on fuel tank being empty on arrival and rule on what happens if a team is late for a scrutineering slot. Updated visitor tickets. Added Plascore Special Award

Abbreviations


- ASF** Autonomous System Form.
- ASR** Autonomous System Responsible.
- ASRQ** ASR Qualification.
- BPPV** Business Plan Pitch Video.
- CET** Central European Time.
- CRD** Cost Report Documents.
- CV** Internal Combustion Engine Vehicle.
- DCPI** Driverless Cup Participation Intention.
- DLDS** Data Logger Download Station.
- DOO** Down Or Out.
- DSS** Design Spec Sheet.
- EBS** Emergency Brake System.
- EDR** Engineering Design Report.
- ESF** Electrical System Form.
- ESO** Electrical System Officer.
- ESQ** Electrical System Officer Qualification.
- EV** Electric Vehicle.
- FSG** Formula Student Germany.
- FSPT** Formula Student Portugal.
- GMT** Greenwich Mean Time.
- IAD** Impact Attenuator Data.
- SC** Senior Cup.
- SE3D** Structural Equivalency 3D Model.
- SES** Structural Equivalency Spreadsheet.
- SESA** SES Approval.
- VSV** Vehicle Status Video.

Introduction

Formula Student is the biggest international competition for university students, where they are challenged to design, build and compete with a formula-style race car.

This is the handbook for Formula Student Portugal 2024. Whenever in conflict, it supersedes Formula Student Rules 2024 v1.1 (a.k.a. FS Rules).

The Handbook presents general information about the event, the registration details, important dates, rules and guidelines to follow during the event, campsite information, details regarding technical inspection, static events and dynamic events, an overview of class 2 and the officials organizing the event.

Throughout this handbook, whenever you see this symbol  you can use it to quickly jump to its location in Google Maps.

PT 1 General Information

PT 1.1 Competition Categories

PT 1.1.1 FSPT 2024 will host two classes: Class 1 (C1), where teams are expected to compete in both Static and Dynamic events, and Class 2 (C2), where teams only compete in the Static events.

PT 1.1.2 Class 1 is further split into two categories: Electric Vehicles (EV) and Combustion Vehicles (CV).

PT 1.1.3 An additional Driverless Cup (DC) will be hosted for all C1 teams with driverless cars.

PT 1.2 Applicable Rules

PT 1.2.1 FSPT 2024 will follow the latest version of the Formula Student Rules 2024. Whenever in conflict, the rules in this Handbook supersede it. The Formula Student Portugal Competition Handbook is to be considered part of the rules.

PT 1.3 Announcements

PT 1.3.1 Official announcements will be made through FSPT website formulastudent.pt and directly to the team's e-mail, supplied by the team during the registration process.

PT 1.3.2 During the event all announcements will also be published in the Race Control. These include: preliminary results, penalties, finalists, schedule changes and others.

PT 1.4 Dates and Places

PT 1.4.1 FSPT 2024 will be held from the 3rd to the 7th of September 2024 in Kartódromo de Castelo Branco, Castelo Branco, Portugal. Throughout this handbook this location will be known as the "Event Site".

PT 1.4.2 Teams participating in FSPT 2024 will be staying at Parque de Campismo Municipal de Castelo Branco. Throughout this handbook this location will be known as the "Camping Site".

PT 1.4.3 From the camping to the event site takes roughly 8 minutes by car. It is strongly discouraged to walk this distance. Regular shuttles will be scheduled, nonetheless teams are advised to bring cars or vans.



PT 1.5 Emergency Information

PT 1.5.1 In case of a minor injury (shallow cut, small bruising, etc) please contact one of the Staff members. A First-Aid medical post is readily available during the working hours of the event site.

PT 1.5.2 If someone is severely injured and requires urgent help please do not hesitate and immediately call the emergency services: **112**. If you have proper first aid training, help to the best of your ability. Contact an organization member as soon as possible.

PT 1.5.3 In case of need:

- **Hospital Amato Lusitano (Hospital)**

Address: Av. Pedro Alvares Cabral 3, Castelo Branco

Phone: +351 272 000 180 (Urgency)



- **Bombeiros Voluntários de Castelo Branco (Firefighters)**

Address: R. Cmte. Lucio Pereira, Castelo Branco

Phone: +351 272 342 122



- **GNR - Comando Territorial de Castelo Branco (Police)**

Address: Av. Cidade de Zhuhai 167RC, 6000-077, Castelo Branco

Phone: +351 272 340 900



PT 2 Registration

PT 2.1 Available Slots

PT 2.1.1 In FSPT 2024 there will be a total of 30 C1 slots and 10 C2 slots.

PT 2.1.2 Of the total C1 slots, 10 will be dedicated to CV teams and 20 to EV teams. If the number of registered teams does not fill the available slots and the corresponding waiting list is exhausted then the waiting list of the other category is used instead. A minimum of 3 teams per category is required for the competition to take place.

PT 2.1.3 The number of DC slots is equal to the number of C1 teams registered.

PT 2.2 Reserved Slots

PT 2.2.1 The reserved slots define a set of teams that, after the registration, are placed at the top of the list independently of the Quiz results.

PT 2.2.2 Table 1 presents the reserved slots for the different classes. The FSPT 2023 results can be found on the official website.

Classes	Types	Number of slots
C1	TOP 3 2023 EV	3
	TOP 3 2023 CV	3
	TOP 3 2023 DV Cup	3
	Winner Class 2 2023	1
	PT teams	5
C2	PT teams	5

Table 1: Reserved slots.

PT 2.2.3 The reserved slots are cumulative, which means that if a team fits within 2, or more, types of reserved slots then it fills that many reserved slots (e.g. If a portuguese team is also a TOP 3 2023 CV and it wishes to register for FSPT then there are only 2 more TOP 3 2023 CV and 4 more PT team slots available).

PT 2.3 Team Registration

PT 2.3.1 For FSPT 2024 the registration process will be based on a quiz, which will cover all fields related to formula student.

PT 2.3.2 The teams will be sorted by the number of correct answers.

PT 2.3.3 In case of a tie between two teams that have the same number of correct answers, the quiz time will be deciding factor. Quiz time is counted from 9:00 CET until the team finishes.

PT 2.3.4 In order to register, teams must follow the steps below:

1. Create a team account on FSG website - formulastudent.de - at least 24h before the quiz. This is where teams will submit some of the required technical documents.
2. Create a team account on FSCH website - fsswitzerland.ch.
3. Complete the FSPT/FSCH quiz which will be available on this link on the 26th of January at 9:00 CET.
4. At the end of the quiz, select whether your team wants to go to FSPT, FSCH or both.
5. Complete the FSG quiz which will be available on the FSG website on the 26th of January at 13:00 CET. The actual results from this quiz are irrelevant for the registration in either FSPT or FSCH but it is required in order to submit technical documents. CV and C2 teams will have a separate option to register without going through the quiz.

PT 2.3.5 The quiz solution will be published on the 27th of January at 13:00 CET on the official website.

PT 2.3.6 Teams have 4h to send their protests to geral@formulastudent.pt.

PT 2.3.7 Final quiz results will be published on the 29th of January at 13:00 CET on the official website. Simultaneously, registered teams will receive a proforma by e-mail with the registration fee and payment information.

PT 2.4 Registration Fee

PT 2.4.1 Upon registration in C1, a fee of 1700€ (+VAT, if applicable) must be paid within the deadline.

PT 2.4.2 Upon registration in C2, a fee of 750€ (+VAT, if applicable) must be paid within the deadline.

PT 2.4.3 Teams will have 3 days to pay the registration fee from the moment they receive a proforma. Proof of payment is enough to comply with this deadline and should be sent to geral@formulastudent.pt. If a team fails to pay the registration fee within the deadline then it will be de-registered.

PT 2.5 Waiting List

PT 2.5.1 If there are more team registrations than open slots then a waiting list is created.

PT 2.5.2 Whenever a slot opens either due to a team failing to pay the registration fee or due to a de-registration then the team at the top of the waiting list is contacted with the payment details.

PT 2.5.3 To remain on the waiting list teams must continue to submit the required

documents according to section PT 3.

PT 2.5.4 The waiting list will be dissolved either when no teams are left or upmost on the 27th of August 2024.

PT 2.6 De-registration

PT 2.6.1 If a team fails to submit the required documents by the dates specified in section PT 3 and continuously ignores e-mails sent by the FSPT organization then it will be de-registered.

PT 2.6.2 If a team is de-registered before May 1st then a refund of 50% will be issued. After this date there is no refund.

PT 2.7 No Driverless Events

PT 2.7.1 Teams that do not intend to run in autonomous mode at the competition must send an e-mail to geral@formulastudent.pt stating they do not intend to participate in the driverless events before the deadline shown in table 2. This cannot be undone. All driverless events will be scored with 0 points. The team will not be allowed to run in autonomous mode.

PT 2.7.2 Teams with the status "No Driverless Events" are not required to upload the ASF, ASRQ and the DBC file. Therefore, if these deadlines are missed, the team will not be de-registered from the competition. All correction requests for these deadlines become invalid immediately. Existing penalties remain if the status "No Driverless Events" is handed in after a deadline already expired.

PT 2.8 Team Member and Camping Registration

PT 2.8.1 After the team successfully registered, team members are also required to register. To enter the event-site, one has to be registered as team member.

PT 2.8.2 Team member registration fee is 60€ (+VAT, if applicable) per team member.

PT 2.8.3 A camping site will be available, only for registered Team Members. More information on this in PT 5. The Camping Fee is 40€ (+VAT, if applicable) per team member, for the whole event.

PT 2.8.4 A Google Forms will be made available by e-mail to registered teams on the 1st of June. This Forms must be completed by all team members attending the event. If a Team member is staying at the Campsite, the respective checkbox should be selected.

PT 2.8.5 On the 21st of June 2024 the Forms will be closed and a pro-forma will be generated and sent to the team's e-mail according to the number of team members registered thus far. Teams must show proof of payment by the 28th of June 2024.

PT 2.8.6 After the deadline in PT 2.8.5, team members can only be registered on

site, at the Race Control. The registration can only be performed by the team captain or the team member accompanied by the team captain. Please see payment options at the PT 4.3 section.

PT 2.8.7 The team member registration fee after the deadline in PT 2.8.5 is 100 € (+VAT, if applicable).

PT 2.8.8 The camping fee after the deadline in PT 2.8.5 is 60 € (+VAT, if applicable).

PT 2.9 Visitors

PT 2.9.1 Visitors will be allowed on the event site on all days of the event as long as they acquire a ticket at the reception.

PT 2.9.2 Visitor tickets can be purchased at the event reception. The day pass costs 5€ and the week pass costs 15 €. Both passes provide a one-time 5€ discount on kart renting. The payments must be made in cash.

PT 3 Important Dates

PT 3.1 Team Registration

PT 3.1.1 Team registration for all teams starts on 26-01-2024 09:00 CET with the registration quiz and ends after the registration quiz has been closed on 26-01-2024 11:00 CET.

PT 3.2 Deadlines

PT 3.2.1 Teams will receive access to a private Google Drive folder on the 1st of May.

PT 3.2.2 The required documents and information must be uploaded to the FSG competition website, sent by e-mail to geral@formulastudent.pt or uploaded to the team's drive by the team captain and/or their deputies according to Table 2 for Class 1 teams and Table 3 for Class 2 teams.

PT 3.2.3 Deadlines are specified such that documents need to have been submitted and received by the website, drive or e-mail before the time specified by the respective deadline.

PT 3.2.4 All documents must comply with a maximum size of 40 MB.

PT 3.2.5 Change of FS Rules - A5.1.1 - SESA is not required for FSPT 2024. Accordingly, FS Rules - A5.7 does not apply.

Date	Document	Category	Submission
29-02-2024-13:00 CET	DCPI	EV, CV	E-mail
15-03-2024-13:00 CET	IAD	EV, CV	FSG
15-03-2024-13:00 CET	SE3D	EV, CV	FSG
15-03-2024-13:00 CET	SES	EV, CV	FSG
29-03-2024-13:00 CET	ASF	DV	FSG
29-03-2024-13:00 CET	ESF	EV	FSG
31-05-2024-13:00 CEST	BPPV	EV, CV	Drive folder
31-05-2024-13:00 CEST	DSS	EV, CV	Drive folder
31-05-2024-13:00 CEST	EDR	EV, CV	Drive folder
21-06-2024-13:00 CEST	ASRQ	DV	Drive folder
21-06-2024-13:00 CEST	ESOQ	EV	Drive folder
05-07-2024-13:00 CEST	VSV	EV, CV	Drive folder
26-07-2024-13:00 CEST	CRD	EV, CV	Drive folder
26-07-2024-13:00 CEST	Final DBC file	DV	FSG
16-08-2024-13:00 CEST	"No DV Events", PT 2.7	EV, CV	E-mail

Table 2: Class 1 document deadlines

PT 3.2.6 The IAD, SES, SE3D and ESF documents are not mandatory for Class 2 teams and there are no extra points awarded or penalties. Regardless, C2 teams are

strongly encouraged to upload these documents which will be reviewed by the same experts as C1 teams and feedback will be given.

Date	Document	Category	Submission
30-06-2024-13:00 CEST	BPPV	EV, CV	Drive folder
30-06-2024-13:00 CEST	DSS	EV, CV	Drive folder
30-06-2024-13:00 CEST	EDR	EV, CV	Drive folder
01-08-2024-13:00 CEST	IAD	EV, CV	FSG
01-08-2024-13:00 CEST	SE3D	EV, CV	FSG
01-08-2024-13:00 CEST	SES	EV, CV	FSG
01-08-2024-13:00 CEST	ESF	EV	FSG
18-08-2024-13:00 CEST	CRD	EV, CV	Drive folder

Table 3: Class 2 document deadlines

PT 4 During the event

PT 4.1 Helpful locations

PT 4.1.1 Here is a list of places you might find useful during the event:

- **Groceries - Continente (also has 2 ATMs)**

Address: Av. da Europa Quinta da Taipa, 6000-145 Castelo Branco

Schedule: 8AM-10PM



- **Cheapest gas station - Auchan**

Address: Zona Industrial de Castelo Branco, 6000-459 Castelo Branco

Schedule: Open 24h



- **General workshop supplies - Leroy Merlin**

Address: Estrada Nacional 18 Apartado 1131, 6000-050 Castelo Branco

Schedule: 9AM-9PM



- **Specialized workshop supplies - BeiraTools**

Address: Zona industrial, Rua D, 6000-459 Castelo Branco

Schedule: Mon.-Fri.: 9AM-1PM, 2:30PM-6:30PM, Sat.: 9AM-12:30PM



- **Camping supplies - Decathlon**

Address: R. Cunha e Castro 14, 6000-060 Castelo Branco

Schedule: 9AM-9PM



- **Pharmacy - Farmácia Tanara Fórum**

Address: Av. Prof. Dr. Egas Moniz 901, 6000-901, Castelo Branco

Schedule: 9AM-10PM



- **Affordable Restaurant - Roxo**

Address: Zona Industrial de Castelo Branco, 6000-459 Castelo Branco

Schedule: 9AM-5PM



PT 4.2 Upon arrival

PT 4.2.1 To enter the event site each team member must be identified with an official competition badge and at least one bracelet.

PT 4.2.2 Only registered team members (according to PT 2.8) will be assigned a badge and a bracelet. Extra bracelets will also be provided to team members with

specific roles (Team Captain, ESOs, ASRs and Drivers), upon their registration. See PT 6.2.3 and PT 6.7.1.

PT 4.2.3 The identification badges can be retrieved at the event reception by the team member itself or by the team captain. In order to facilitate the logistics it is advised that the team captain collects the badges and bracelets for all the team members upon arrival.

PT 4.2.4 All teams are required to pay a clean venue deposit of 100€, which will be refunded at the end of the event, after an organization member has inspected the conditions of the team's pit after disassembling. This deposit will not be returned to teams that do not keep the venue clean, including their pits. For example: if a team member is found littering at the event site, the team will not be refunded.

PT 4.2.5 The clean venue deposit shall be paid at the Race Control, before the team is assigned a pit. See section PT 4.3 for more details regarding payment options.

PT 4.2.6 During pit assembling, a maximum of 5 teams are allowed to unload their vans or trucks at the paddock entrance at any given time. The unload order will be defined through a first-come-first-serve basis. A staff member will be keeping track of the order. Each team has 45 min to unload the vans/trucks. If the team is not done at the end of their time slot, they must leave and will be assigned a new slot.

PT 4.2.7 During pit disassembling, a maximum of 5 teams are allowed to load their vans or trucks at the paddock entrance at any given time. The load order will be defined through a first-come-first-serve basis. A staff member will be keeping track of the order. Each team has 45 min to load the vans/trucks. If the team is not done at the end of their time slot, they must leave and will be assigned a new slot.

PT 4.2.8 The detailed schedule for all the procedures described in this section can be found in PT 4.6.

PT 4.3 Race Control

PT 4.3.1 Only cash payments are accepted at the race control. This is also valid for the payment of deposits.

PT 4.3.2 If an invoice is required for payments performed on site, a request must be placed at the race control. The invoices will be sent to the team through the provided email up until 10 business days after the competition has ended.

PT 4.4 Dataloggers and Vests

PT 4.4.1 Each team will receive 4 dynamic area vests and 1 media vest upon registration at the Race Control. EV teams will also receive an official FSG datalogger.

PT 4.4.2 The datalogger requires a deposit of 150€, which will be refunded once the datalogger is returned. The deposit shall be paid at the race control. See PT 4.3 for more details on payment methods.

PT 4.4.3 The dynamic area and media vests require a deposit of 30€ each, which will be refunded once the vests are returned. The deposit shall be paid at the race

control. See PT 4.3 for more details on payment methods.

PT 4.5 Rules and guidelines

PT 4.5.1 As per FS Rules - A6.6, alcohol, illegal drugs, weapons, or other illegal material are prohibited at the event site during the competition. In addition, at the event site if any team member is tested with an alcohol level higher than 0.0%, he or she will be immediately disqualified for the rest of the competition. If a second team member is found to have an alcohol level higher than 0.0% will result in the entire team being disqualified.

PT 4.5.2 Alcohol is allowed at the camping site.

PT 4.5.3 Use of motorcycles, quads, bicycles, skateboards, or rollerblades in the event site is prohibited.

PT 4.5.4 Working on the vehicle or any hardware systems required for its safe operation is strictly forbidden in the camping site. Doing so is considered a violation of FS Rules - A6.4.3 and may result in the entire team being disqualified immediately.

PT 4.5.5 Use of any tool that results in sparks (angle grinder, welding, etc) must be done in the welding area. When using angle grinders, safety glasses are required. Always be aware of your surroundings and perform the necessary work in the safest way possible for you and the other team members. Do not hesitate to contact the Staff if you have any safety-related questions.

PT 4.5.6 Only people identified with the competition badge can enter the venue.

PT 4.5.7 Venue Parking: Section to be completed in a later release.

PT 4.5.8 No cars or vans are allowed outside the venue parking lots except for loading and unloading the pit material, only at the designated time slots as per PT 4.6.

PT 4.5.9 Keep the venue clean. Throughout the venue there are several trash bins and recycling bins, please use them.

PT 4.5.10 No cleaning will be performed in the teams pits during the event.

PT 4.5.11 Smoking is forbidden around the campsite. If you wish to smoke please do so in the designated smoke area. Please use the designated ash trays.

PT 4.6 Schedule

PT 4.6.1 The race control will open on the 2nd of September from 14:00 to 20:00 and on the remaining days from 8:00 to 20:00.

PT 4.6.2 The reception will open on the 2nd of September from 13:00 to 20:00 and on the remaining days from 8:00 to 20:00.

PT 4.6.3 Campsite will open on the 2nd of September from 14:00 and stay open until the 8th of September at 12:00.

PT 4.6.4 The campsite cooking areas will open on the 2nd of September at 16:00.

On all other days of the event these areas are opened from 9:00 to 23:00. The cooking areas will not open on the 8th.

PT 4.6.5 Paddock will open on the 2nd of September at 14:00. On all other days of the event the paddock opens at 7:30 and closes at 22:00. The paddock closes on the 8th at 11:00.

PT 5 Campsite

PT 5.1 Upon arrival

PT 5.1.1 Only registered team members can enter the campsite, so they will need to have competition badges before getting in.

PT 5.1.2 All teams are required to pay a clean campsite deposit of 100€, which will be refunded at the end of the event, after an organization member has inspected the conditions of the team's camping zone after disassembling. The deposit will not be returned to teams that do not keep the campsite clean, including their respective zone as well as cooking areas (PT 5.3) and dishwashing area (PT 5.4).

PT 5.1.3 The clean campsite deposit shall be paid at the Race Control, before the team is assigned a camping zone. See section PT 4.3 for more details regarding payment options.

PT 5.1.4 The camping zone assigned to the team will be provided to the team captain at the time of onsite registration.

PT 5.1.5 Each team will be assigned a clearly marked camping zone in which to assemble their sleeping and social areas. The dimension of each zone takes into account the amount of team members registered before the deadline in PT 2.8.4. No adjustments will be made to account for team members registered on site.

PT 5.1.6 If the team finds the space of their zone insufficient, please inform a staff member.

PT 5.1.7 At time of campsite assembly, there will be staff members to help you find your location.

PT 5.2 General rules

PT 5.2.1 Only people identified with the competition badge can enter the campsite.

PT 5.2.2 No cars or vans are allowed inside the campsite, except to unload or load camping equipment.

PT 5.2.3 It is possible to park cars and small vans at the front entrance of the campsite. No trucks are allowed to park here. Please keep your larger vehicles at the circuit parking lots.

PT 5.2.4 Alternative Parking Lot: Section to be completed in a later release.

PT 5.2.5 No noise is allowed in the campsite after 2am every day except for the 7th of September.

PT 5.2.6 Keep the campsite clean. Throughout the campsite there are several trash bins and recycling bins, please use them. Please do not put trash on the ash collection bins at the cooking areas. These are placed there to reduce fire hazard.

PT 5.2.7 No cleaning will be performed in the teams zones during the entire event.

PT 5.2.8 No open fires are allowed outside the cooking area (PT 5.3). If you wish

to cook at your team's camping zone please do so using electric stoves.

PT 5.2.9 Smoking of regular (combustible) cigarettes is forbidden around the campsite. If you wish to smoke please do so at the front entrance. Please use the designated ash trays.

PT 5.3 Cooking area

PT 5.3.1 The campsite has 2 cooking areas designed for teams to cook at. Their opening hours are depicted in PT 4.6.

PT 5.3.2 Only gas bottles with a maximum capacity less or equal to 30 Kg are allowed in the cooking areas.

PT 5.3.3 After cooking, it must be ensured that there is no way gas can exit the bottles and that the connections to the stoves are completely closed.

PT 5.3.4 After cooking, all ashes shall be disposed in the designated container.

PT 5.3.5 No fires can be left unattended.

PT 5.3.6 At most 3 members of each team can be at the cooking area at any given time. If the area is too crowded this limit may be shortened by any staff member.

PT 5.4 Dishwashing

PT 5.4.1 The campsite is equipped with 2 dishwashing areas. These are not equipped with soap or sponges so teams need to bring their own.

PT 5.4.2 Keep the sinks clean and unclogged.

PT 6 Technical Inspection

PT 6.1 Technical Inspection Sticker

PT 6.1.1 The sticker will be 175x55 mm (WxH). A suitable spot shall be reserved on the upward-facing bodywork between the front bulkhead and the front roll hoop.

PT 6.2 Data Loggers [EV ONLY]

PT 6.2.1 Formula Student Portugal will use the official data loggers from FSG. Ensuring that the Data Logger is working properly is the sole responsibility of the team. The technical specifications and mounting instructions can be found in this link. Two DLDS stations will be available in the paddock tent.

PT 6.2.2 The team must pick up their data logger at one of the DLDS stations at the paddock during the schedule presented in PT 4.6.5. To do so, they have to show proof of data logger deposit payment, as per PT 4.4.2.

PT 6.2.3 ESO and ASR registration will take place during the data logger pick-up. All ESOs and ASRs must have a ESOQ, ASRQ (ASRs only) and a national ID card as well as their student ID ready for inspection.

PT 6.3 Accumulator Inspection [EV ONLY]

PT 6.3.1 The initial accumulator inspection will take place in the technical inspection tent. Any required re-inspection from Wednesday 04-09-2024 and later will take place in the accumulator tent.

PT 6.3.2 All teams that are allowed to enter on Monday 02-09-2024 must bring their accumulators to the accumulator tent by 20 :00 GMT (local time) that day. All teams that have their accumulator inspection on the same day of entering bring their accumulators directly to the accumulator inspection.

PT 6.3.3 If a team misses the aforementioned deadline, a penalty of 10 points is deducted of its overall score for every commenced 12 hours up to a maximum total of 30 penalty points.

PT 6.3.4 The team has to register the accumulator delivery at the accumulator tent.

PT 6.4 Location

PT 6.4.1 Technical inspection will take place in all locations as seen in figure 1. The layout will change depending on the events taking place at a given day.

- **03-09-2024, 04-09-2024 and 06-09-2024:** as seen on figure 1. Brake 1 will be the only designated brake test area. It shall be a part of the practice area. Vehicles queueing for the Brake Test will be given priority with regards

to vehicles queuing for a practice run. The Tech. Inspection tent will run at reduced capacity during 06-09-2024 due to on-going dynamic events.

- **05-09-2024:** During the Skidpad event, the Brake Test will move to the Brake 2 area. It shall be re-opened in the Brake 1 area during the Acceleration Event.
- **07-09-2024:** Day of the Endurance event. There is no planned technical inspection. Any requests shall be evaluated on a case-by-case basis.



Figure 1: Technical Inspection Map

PT 6.4.2 Access to technical inspection shall be enforced as per FS Rules - D1.2.

PT 6.4.3 If a team does not arrive within 10 minutes of the start of the assigned scrutineering slot, this slot shall be converted into a re-scrutineering slot.

PT 6.5 Charging [EV ONLY]

PT 6.5.1 The charging area is a separated dynamic area including separate entrance restrictions.

PT 6.5.2 Only three members per team may enter the charging area at the same time. One of them must be a Electrical System Officer (ESO) or Autonomous System Responsible (ASR), respectively.

PT 6.5.3 Inside the charging area, team members must not wear any conductive jewelry and must not wear any conductive objects of any kind which could come into contact with any part of the accumulator.

PT 6.5.4 400 V, 50 Hz, 3phase CEE charging connectors (3L+N+PE 6h) with 16A and 32A as well as 230V, 50Hz, 1phase CEE 7/3 "Schuko" are available in the charging area.

PT 6.6 Fueling [CV ONLY]

PT 6.6.1 98RON and E85 will be made available during the event. Teams may request officials to fill up their tank at any time. Safety precautions must be taken during this procedure.

PT 6.6.2 Teams should arrive to the FSPT 2024 Event with an empty fuel tank. It will not be possible to empty the fuel tank in the FSPT pits.

PT 6.7 Driver registration

PT 6.7.1 Driver registration will take place during the egress tests in the technical inspection tent. All drivers must have their government issued driver's license and national ID card as well as their student ID ready for inspection.

PT 7 Static events

PT 7.1 Design Scoring

PT 7.1.1 The Engineering Design event will be scored according to the following distribution:

Expertise	Points EV/CV	Points DC
Autonomous Systems	10	50
Aerodynamics and Cooling	20/10*	15/5*
Electronics	20	15
Powertrain	20/25*	15/20*
Mechanical/Structural	25	15
Technical Management	20	15
Vehicle Dynamics and Suspension	25/30*	15/20*
Engineering Design Report	10	10
TOTAL	150	150

Table 4: Engineering Design event scoring distribution (*Team's with no downforce producing aerodynamic devices)

PT 7.2 BPP Scoring

PT 7.2.1 The Business Plan Presentation event will be scored according to the following distribution:

Expertise	Points
Pitch Video	10
Novelty+Content	30
Finances	10
Deep Dive Topic	10
Demonstration and Structure	15
Delivery	10
Questions	10
General Impressions	5
TOTAL	100

Table 5: Bussines Plan Presentation scoring distribution

PT 7.3 Cost Scoring

PT 7.3.1 The Cost and Manufacturing event will be scored according to the following distribution:

Expertise	Points
BOM	3
DBOM	12
CBOM	20
Cost Understanding	35
Real Case	20
Documents Format and Quality	5
Overall Vehicle Cost Knowledge	5
TOTAL	100

Table 6: Cost and Manufacturing scoring distribution

PT 7.4 Design procedure

PT 7.4.1 All topics not specifically covered in this document or other official Formula Student Portugal document default to the Formula Student Germany rules.

PT 7.4.2 The duration of the Engineering Design Event will be 50 min divided in the following manner:

- Introduction of the team, team members and goals for the season (3-5 min)
- Q&A session divided by areas of expertise as per PT 7.1.1 (40-42 min)
- Brief overall feedback (5 min)

PT 7.4.3 Teams may bring any material (including digital) that they believe helps to support their design presentation.

PT 7.4.4 At each instant no more than 12 team members (15 for teams enrolled as DV) can be in the delimited "Judging Area"

PT 7.4.5 An unlimited number of top teams may be chosen by the head of the Engineering Design event to participate in the Engineering Design finals to determine the Engineering Design event winner.

PT 7.4.6 The Engineering Design finals will be held separately from the initial judging. Teams will be informed about their participation during the event.

PT 7.4.7 Information about the Engineering Design Event documents submission will be sent to the teams at a later date.

PT 7.5 BPP procedure

PT 7.5.1 All topics not specifically covered in this document or other official Formula Student Portugal document default to the Formula Student Germany rules.

PT 7.5.2 The duration of the Business Plan Presentation will be 15 min divided in the following manner:

- BP Presentation (10 min)
- Q&A Session (5 min)

PT 7.5.3 All team members participating in the BPP should be presented to the Judges.

PT 7.5.4 Any team member participating in the BPP can answer questions during the Q&A session even if they did not present.

PT 7.5.5 An unlimited number of top teams may be chosen by the head of the BPP event to participate in the BPP finals to determine the BPP event winner.

PT 7.5.6 The BPP finals will be held separately from the initial judging. Teams will be informed about their participation during the event.

PT 7.5.7 BPP finals sessions will be hosted in public sessions.

PT 7.5.8 Information about the Business Plan Presentation event documents submission will be sent to the teams at a later date.

PT 7.6 Cost procedure

PT 7.6.1 All topics not specifically covered in this document or other official Formula Student Portugal document default to the Formula Student Germany rules.

PT 7.6.2 The duration of the Cost and Manufacturing Event will be 50 min divided in the following manner:

- Introduction of the team, team members and goals for the season (3 min)
- BOM Discussion (15 min)
- Cost Understanding (15 min)
- Real Case (15 min)
- Brief overall feedback (2 min)

PT 7.6.3 Teams may bring any material (including digital) that they believe helps to support their cost presentation.

PT 7.6.4 An unlimited number of top teams may be chosen by the head of cost event to participate in the cost and manufacturing finals to determine the cost and

manufacturing event winner.

PT 7.6.5 The cost and manufacturing finals will be held separately from the initial judging. Teams will be informed about their participation during the event.

PT 7.6.6 The BOM, DBOM and CBOM is to be created using the FSG Cost Report tool. The whole Cost Report is then to be exported using the corresponding “PDF Export” function in the Cost Report tool. The exported PDF should be zipped together with the Cost Report Explanation file (CREF) and Supporting Material File (SMF).

PT 7.6.7 The use of excel or other programmes to create BOM, DBOM and CBOM is prohibited. The FSAE format is also not permitted.

PT 7.6.8 There are no rules regarding the style of the CREF other than it should be a comprehensive explanation of the assumptions and calculations that were used to derive for example the material costs or labour costs used in the CBOM. It should also contain which specific cost figures were used, e.g. the cost of one machine operation hour.

PT 7.6.9 The CBOM must be created for the same “system” as defined in the FSG 2024 competition handbook.

PT 7.6.10 The DBOM must be created for the same “system” as defined in the FSG 2024 competition handbook.

PT 7.6.11 FSPT defines "processes" as follows: Processes are the operations necessary to produce the "part" out of the "material", create assemblies out of parts and assemble it to the vehicle.

PT 7.6.12 Information about the Cost and Manufacturing Event documents submission will be sent to the teams at a latter date.

PT 8 Dynamic events

PT 8.1 Dynamic Events Schedule

PT 8.1.1 A detailed dynamic events schedule will be published in a later release of this document.

PT 8.1.2 An "OPEN" or "CLOSED" sign at the entrance of each Dynamic Event will indicate whether the session is active.

PT 8.1.3 Teams with a Green Flag or a GO signal before the Closing Time can complete their run. Additional runs are allowed immediately after Closing Time.

PT 8.1.4 Re-runs are permitted if necessary after Closing Time.

PT 8.2 Behavior Inside Dynamic Area

PT 8.2.1 Equipment that can't be carried by one team member is allowed only in inspection and preparation areas, not in dynamic event queues.

PT 8.2.2 Once the vehicle moves under its power, team members in the dynamic area must wait in their designated area until the run concludes.

PT 8.2.3 After the run, the vehicle must be promptly collected at the exit by two team members using the push bar.

PT 8.2.4 The ASR designated area will have a raised platform for better track and vehicle visibility.

PT 8.3 Event Participation Limits and Procedures

PT 8.3.1 Each team is allowed 4 Manual runs and 2 Driverless runs for the Acceleration and Skidpad events.

PT 8.3.2 For Driverless runs, if the vehicle does not enter "AS Ready" state within 3 min after being staged, the team may be sent back to the preparation area by the officials. In this case any priority is lost.

PT 8.4 Track Layout and Characteristics

PT 8.4.1 Autocross and Endurance Tracks may have non-straight Slaloms with 7.5m to 15m spacing between cones.

PT 8.4.2 Each lap of Driverless Autocross and Trackdrive may exceed 500m.

PT 8.4.3 The total distance of Trackdrive won't exceed 5000m.

PT 8.5 Track Markings and Delimiters

- PT 8.5.1** Laser Timing Gates will be used for all dynamic events.
- PT 8.5.2** Cones mark the track limits, with blue cones on the left, yellow cones on the right, and orange cones for entry, exit and stopping lanes.
- PT 8.5.3** The maximum distance between two consecutive cones is 5m.
- PT 8.5.4** Big orange cones mark start, finish, and timekeeping lines.
- PT 8.5.5** Cones used are specified in Table 7.
- PT 8.5.6** Start and finish lines are marked with white paint.
- PT 8.5.7** There may be track limit lines, except for Acceleration and EBS-test, marked with yellow or white paint.
- PT 8.5.8** The position of each individual cone will be marked on the ground, for reference of DOO.
- PT 8.5.9** Officials may draw lines on the ground, which may not be perfect or continuous.
- PT 8.5.10** Other markings on and around the track, such as those from the Kartodromo de Castelo Branco's infrastructure or previous events, may be present. These markings can have different sizes and colors and cannot be removed or altered by officials.
- PT 8.5.11** Spare cones may be stacked and standing at the trackside at a recognizable distance.
- PT 8.5.12** Timekeeping equipment may be surrounded by cones outside the track boundary.
- PT 8.5.13** 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.





Big Orange Cones	Small Orange Cones	Small Yellow Cones	Small Blue Cones
			
WEMAS 307.610500.00.00	WEMAS 400.000013.00.00	WEMAS 400.000013.01.10	WEMAS 400.000043.00.00
285 x 285 x 505 mm 1.05 Kg		228 x 228 x 325 mm 0.45 Kg	

Table 7: Track delimiting cones.

PT 8.6 Endurance Running Order

PT 8.6.1 The running order for Endurance will be published at the end of the day before the event, according to FS Rules - D7.3.

PT 8.6.2 At least the next three vehicles in the running order must be in the queue during the endurance.

PT 8.6.3 Vehicles must continuously fill the queue.

PT 8.6.4 A vehicle is defined as running out of order and penalized according to FS Rules - D9.2.1 if it is missing from the queue, i.e. if there is at least one vehicle within the first 3 positions in the queue that has a later running order place.

PT 8.6.5 Running out of order is only possible at the end of the session, if still within the Event Slot.

PT 8.7 Trackdrive running order

PT 8.7.1 The running order for Trackdrive will be published before the start of the session, according to FS Rules - D8.2.

PT 8.7.2 At least the next vehicle in the running order must be in the queue during the trackdrive.

PT 8.7.3 Vehicles must continuously fill the queue.

PT 8.7.4 A vehicle is defined as running out of order if it is missing from the queue, i.e. if there is at least one vehicle ahead in the queue that has a later running order place.

PT 8.7.5 Vehicles out of order will be moved to the end of the order and will only run if still within the Event Slot indicated in PT 4.6.

PT 9 Class 2

PT 9.1 Overview

PT 9.1.1 The inclusion of a Class 2 competition lined with the vision of Formula Student Portugal to both increase the number of Universities competing in Formula Student as well as to fast-track new teams into building a Formula Student car.

PT 9.1.2 The Class 2 competition is composed of 3 different static events: Engineering Design(150pts); Business Plan Presentation(100pts); Cost and Manufacturing (100pts).

PT 9.1.3 A rulesbook has been published with all necessary details regarding the Class 2 competition here.

PT 9.1.4 Class 2 teams will have a dedicated PIT slot.

PT 9.1.5 As specified in PT 3.2.6, C2 teams are strongly encouraged to produce and upload the IAD, SES, SE3D and ESF documents according to the deadlines specified in table 3 in order to take full advantage of FSPT. No penalty will be given to teams that do not submit these documents.

PT 10 Senior Cup

PT 10.1 Introduction

This section of the handbook shall serve exclusively for Formula Student Portugal 2024 Senior Cup. We already told it to the kids, but the same goes for you: whenever in conflict, it supersedes Formula Student Rules 2024 v1.1 (a.k.a. FS Rules) and, as an added bonus, whatever was written previously in this Handbook.

This section will be the golden ticket for the car you thought would never see a trophy again to return to the track. Tell the new guys to stop using your masterpiece of engineering as a spare parts depot and haul it to Castelo Branco for (possibly) one last shot at the top step. Here you will find specific registration details, important dates, tech inspection information, static events and dynamic events specific to your timepieces.

Formula Student Portugal Senior Cup (hereafter also SC) welcomes both gas guzzlers and electric vehicles. As a reminder, while this section may at times supersede the FS rules and/or the rest of the Formula Student Portugal Handbook, it does not replace them.

PT 10.2 General Info

PT 10.2.1 In FSPT 2024 SC teams are expected to only compete in Dynamic events.

PT 10.2.2 There will be no split between Electric Vehicles (EV) and Combustion Vehicles (CV) for scoring.

PT 10.2.3 FSPT 2024 SC will follow the FS rules on a case-by-case basis. Submission of design documents such as the SES, IAD, ESF or similar might be requested following the same principle. Example: if the competing vehicle is from 2015, the 2015 FS rules shall apply. Whenever in conflict with the FS Rules from the year the vehicle was first meant to compete in, this ruleset will supersede it. The FSPT 2024 SC chapter of the handbook is to be considered part of the rules.

PT 10.2.4 FSPT 2024 SC scoring will be based on the FS Rules in a way that will lead to the same maximum 1000 overall points.

PT 10.3 Registration

PT 10.3.1 In FSPT 2024 there will be a total of 8 SC slots.

PT 10.3.2 For FSPT 2024 SC the registration process will be based on a first-come-first-served basis.

PT 10.3.3 The teams will be sorted according to the age of their vehicle. The older will get precedence in the scrutineering queue.

PT 10.3.4 Whenever there is a clear relationship between any SC team and any C1

team, the two shall be considered as entirely different teams.

PT 10.3.5 No SC team member may be an active member of any Formula Student team.

PT 10.3.6 If the car that shall compete in the SC is a predecessor of another registered for C1 in FSPT 2024, the registration fee for the SC shall be waived.

PT 10.3.7 In case the SC team is coming on its own, a fee of 875€ (+VAT, if applicable) will apply.

PT 10.4 Event

PT 10.4.1 SC team members may only work on SC vehicles. In a similar fashion, C1 and C2 team members may only work on C1 and C2 vehicles, respectively. A breach of this rule may lead to penalty and/or disqualification of the member(s) and/or team(s).

PT 10.5 Technical Inspection

PT 10.5.1 Vehicles shall be submitted to the regular format of scrutineering, i.e. accumulator, electric system, mechanical, noise, tilt, rain and brake tests.

PT 10.5.2 A modified technical inspection procedure shall apply for all SC vehicles. Checks will be relaxed when compared to the most recent technical inspection standards for accumulator, electrical and mechanical inspections. A special emphasis shall nonetheless be given to the safety critical components and systems.

PT 10.5.3 Vehicle numbering must be within the range 500-699.

PT 10.5.4 [EV ONLY] All SC EV teams must follow ruleset A4.3 from the 2024 FS rules. A4.3.4 and A4.3.8 shall be waived for the SC competitors. ESO nomination shall be done during the online team-member registration procedure. Because A4.3.8 is waived, a liability agreement will be presented for signature at the event.

PT 10.5.5 [EV ONLY] TSAL logic and color scheme will be evaluated according to the year of the respective vehicle. Teams must present a summary of how the operating principle differs from the one described in the 2024 FS Rules section EV4.10.

PT 10.5.6 [CV ONLY] Vehicles equipped with an Electronic Throttle Control (ETC) shall have it inspected during mechanical inspection. Part of the inspection will be held in the engine test area and shall focus on the electric operation of ETC.

PT 10.5.7 Vehicles must be equipped with a BSPD compliant with the 2024 FS Rules T11.6. A template circuitry can be found on the FSG website.

PT 10.5.8 All starting vehicles must submit a VSV according to 2024 FS Rules subsections A5.6.1 and A5.6.3. The deadline shall coincide with the one for C1.

PT 10.5.9 All used tires must be used according to manufacturers recommendations, i.e. follow minimum tread and maximum age requirements.

PT 10.6 Static events

PT 10.6.1 There will be no static events for SC teams.

PT 10.6.2 SC team members may however volunteer for the role of C1 and C2 judge. If a SC team member decides to be a judge, he/she will not be allowed to enter any scrutineering dynamic area for the first three days of the event (starting on the 3rd of September).

PT 10.7 Dynamic events

PT 10.7.1 Contrary to what was used for the technical part, dynamic area rules shall follow the 2024 FS Rules chapter D.

PT 10.7.2 Driver equipment may only be changed between team outside of the dynamic area.

PT 10.7.3 Only drivers which have passed the egress test will be allowed to compete.

PT 10.7.4 Acceleration & Autocross: One glory run will be allowed per team, i.e. no power restrictions shall apply. This will only be allowed for the second run of the second driver.

PT 10.7.5 C1 teams will be given preference in all dynamic events (except endurance), irrespective of which run they are on. Please make sure to queue up with enough time to spare. SC vehicles will be the first to run for the Endurance event.

PT 10.8 Special Awards

PT 10.8.1 Participation in any Special Awards is compulsory. There is a disadvantage if a team decides not to bring something extra to the table. Formula Student Portugal reserves the right to judge SC teams. The more patina, the better. You are invited to show the new kids on the block who was and still is the boss. Make your presence be felt and show the current generation what is the true meaning of being part of a racing team. Be creative!

PT 11 Special Awards

Participation in Special Awards is voluntary. There is no disadvantage if a team decides not to take part. In some cases, prize money is awarded to the best teams.

PT 11.1 Hydrogen Concept Challenge

PT 11.1.1 In collaboration with FS Austria, FS Alpe Adria, FS East, FS France and FS Future a Hydrogen Concept Challenge will take place in FSPT 2024.

PT 11.1.2 The Hydrogen Concept Challenge is intended to introduce students to the topic of hydrogen. The aim is to develop concepts before vehicles with hydrogen fuel cell technology can be fully integrated into the EV and vehicles running on hydrogen can be fully integrated the CV/hybrid class.

PT 11.1.3 Further information will be published in a separate PDF at a later date. The challenge will be the same for all events offering a Hydrogen Concept Challenge.

PT 11.2 The Business Plan Catalyst Award

PT 11.2.1 Formula Student Portugal introduces the "Business Plan Catalyst Award" in the Class 2 category. This award is designed to recognize and reward the team that delivers the most innovative and strategically sound business plan, with a special focus on the Deep Dive Topic.

PT 11.2.2 The award serves as a significant motivator for Class 2 teams, propelling them towards their goal of advancing to Class 1. It offers a one-year sponsorship, providing essential support and resources.

PT 11.2.3 Only teams participating in the Class II event are eligible for the award.

PT 11.2.4 Further information will be published in a separate PDF at a later date.

PT 11.3 Plascore IAD Special Award

PT 11.3.1 Plascore GmbH & Co. KG, based in Waldlaubersheim, Germany, is sponsoring the Special Award for the most meticulously prepared Impact Attenuator Device (IAD) documentation, characterized by precision, innovation, and clarity.

PT 11.3.2 Participation in FS Portugal and submission of the IAD documentation via the FSG website automatically qualifies each Class 1 team for the Special Award.

PT 11.3.3 The following criteria dictating the selection process:

1. Minimal Errors: Priority is given to submissions with the fewest errors identified by IAD reviewers.
2. Document Clarity and Structure: The coherence and organization of the documentation.

3. Website Submission Accuracy: The number of fails on the FSG website.
4. Innovative Design: A preference for own designs over standard designs.

PT 11.3.4 The winning team, which will be announced at FSPT2024, will receive a prize money of 1000 euros.

PT 12 Officials

PT 12.1 Color-Code

FSPT officials are easily recognisable through the color of polo shirts used:

- White shirts - Core organization
- Yellow shirts - Logistics team (also known as FSPT minions)
- Blue shirts - Static event team
- Green shirts - Scrutineering team

PT 12.2 Core organization

The names and roles of the core organization are shown in table 8. Any questions or clarifications should be sent to geral@formulastudent.pt.

White shirt	Role
André Santos	Head of Event
António Bento	Head of Scrutineering
Inês Viveiros	Head of Logistics
João Rego	Head of Marketing
Luís Abreu	Head of Dynamics
Pedro Costa	Head of Statics
Pedro Marques	Head of Sponsors
Pedro Oliveira	Head of Finance
Ricardo Ferreira	Minister of Foreign Affairs

Table 8: White shirts and respective roles.