



# **FORMULA STUDENT SWITZERLAND**

Formula Student Switzerland

**Handbook 2023**

*Version 1.0*

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## Changelog

Version 1.0 Initial version



## **CH 1 General Information**

### **CH 1.1 Competition**

- CH 1.1.1 The only class of Formula Student Switzerland is Electric Vehicle (EV). DV disciplines are not included. Driverless Cup (DC) is not offered.
- CH 1.1.2 The competition time zone is Central European Time (CET) or Central European Summer Time (CEST) from last Sunday of March to last Sunday of October.
- CH 1.1.3 The competition language is English.

### **CH 1.2 Competition Dates and Place**

- CH 1.2.1 FS Switzerland 2023 will be held from 1st until 5th of July 2023.
- CH 1.2.2 The competition site is:  
Hintermattstrasse 6  
3985 Geschinen  
Switzerland

### **CH 1.3 Competition Website**

- CH 1.3.1 The official competition website is: <https://www.fsswitzerland.ch>.

### **CH 1.4 Rules**

- CH 1.4.1 FS Switzerland will comply with the "Formula Student Rules 2023" (FS Rules) published by Formula Student Germany here: <https://www.formulastudent.de/fsg/rules/>
- CH 1.4.2 FS Rules together with this handbook form the regulations for FS Switzerland. In case of ambiguity to the FS Rules, the FS Switzerland Handbook are given priority over the FS Rules.
- CH 1.4.3 All rules questions regarding FS Rules must be asked using the **FSG rules tracker**. As FS Switzerland officials have access to this tool, only rules questions and FAQ from FSG will be accepted at FS Switzerland.
- CH 1.4.4 All rules questions regarding this handbook must be asked via [rules@fsswitzerland.ch](mailto:rules@fsswitzerland.ch)
- CH 1.4.5 Due to the fact, that there will be no driverless competition at FS Switzerland, there are some changes to the rules, that teams with only electric car are allowed to drive at the event.
- CH 1.4.6 Vehicles with features which are mentioned in T14 may participate, but must be driven in manual mode only.
- CH 1.4.7 T14.1.1 does not apply.
- CH 1.4.8 Parts of the autonomous system may be removed permanently before the competition. Changes after technical inspection are not allowed.



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- CH 1.4.9 The ASMS, see T14.7, must be locked in the "Off" position at any time during the event.
  - CH 1.4.10 The "Autonomous System Inspection", see IN1.1.1, does not apply. However, the functional safety of the deactivated autonomous system will be checked.
  - CH 1.4.11 "Adjustments of AS sensors" and "(De-)Coupling of actuators as allowed in T14.9" of IN1.5.1 does not apply.
  - CH 1.4.12 EBS test, see IN11.2, is not required.

## **CH 1.5 Distribution of Points**

<b>Discipline</b>	<b>Points</b>
Business Plan Presentation	75
Cost and Manufacturing	100
Engineering Design	150
Skid Pad	75
Acceleration	75
Autocross	100
Endurance	325
Efficiency	100
<b>Overall</b>	<b>1000</b>

## **CH 1.6 Vehicle Shipping & Temporary Importation**

- CH 1.6.1 Customs and other documents like ATA Carnet, inspecting shipments as well as reporting and documenting damage of the shipment has to be done by the team. See our [Importation Guide](#) for more information. Feel free to contact us on [info@fsswitzerland.ch](mailto:info@fsswitzerland.ch), if you have any questions. We will help you as much as possible.
- CH 1.6.2 Teams are advised to consult their shipping company or freight forwarder to ensure that their shipment fully complies with all relevant customs, import/export and aviation shipping requirements.
- CH 1.6.3 Teams that can't procure an ATA carnét are advised to contact the organizers regarding a customs declaration for temporary admission.
- CH 1.6.4 All teams using an external shipping or freight forwarder must coordinate the transport with the FS Switzerland Organisation. Contact us on [info@fsswitzerland.ch](mailto:info@fsswitzerland.ch).

## **CH 1.7 Covid-19 pandemic**

- CH 1.7.1 FS Switzerland will adapt the current rules given by the Swiss government. Teams will be contacted in case of changes regarding the event. The current restriction can be read [here](#).



## **CH 2 Registration**

### **CH 2.1 Team Registration**

- CH 2.1.1 The team registration will take place in form of a quiz at 2023-01-27 9:00 CET.
- CH 2.1.2 All important information regarding the registration can be found here: [Registration Information](#)
- CH 2.1.3 The protest time starts, when the quiz results are published and ends 3 hours later.
- CH 2.1.4 Teams must create a team account on the competition website until 24 hours before the registration quiz starts.
- CH 2.1.5 Once the quiz has been completed, registering for the competition is possible by agreeing the rules and selecting a free vehicle number between 01 and 99.
- CH 2.1.6 Reserved slots (see CH 2.2.2) will be assigned to the teams. All unused reserved slots will be assigned to all other teams, with regard to their quiz result.
- CH 2.1.7 All assigned teams will be placed on the pending list, which can be viewed on the competition website. In order to move to the participating list, they have 3 days (72 hours) to pay the registration fee (see CH 2.3). Once all slots have been filled, all additional teams will be placed on a waiting list (see CH 2.4).

### **CH 2.2 Registration Slots**

- CH 2.2.1 FS Switzerland 2023 is limited in total to 30 teams.
- CH 2.2.2 Reserved slots for FS Switzerland 2023 will be assigned to the top 3 teams overall of FS Switzerland 2022 and up to 5 teams from Switzerland.
- CH 2.2.3 All remaining and unused reserved slots will become available for all other teams as mentioned on the registration website.

### **CH 2.3 Registration Fee and Camping Fee**

- CH 2.3.1 The Registration fee is 2200 CHF. Every team members can be registered for 40 CHF per participant with the Team Member Registration Form (TMRF) deadline (see CH 3.2). Team members may register after this deadline for a fee of 100 CHF per participant. Due to the COVID-19 pandemic, there is a possibility that there will be a limit imposed on team size in order to follow public regulations.
- CH 2.3.2 All pending teams will get an invoice until 2023-01-30 9:00 CET. The registration fee must be paid within 3 days (starting with receiving the invoice and ending on 2023-02-02 9:00 CET).
- CH 2.3.3 Teams which didn't pay the registration fee will be de-registered and the next team on the waiting list. Teams which were previously de-registered and decide to register again will have to reapply to the event following A 5.5.
- CH 2.3.4 There will be no refund for the registration fee, if the team decides to withdraw its registration.
- CH 2.3.5 The camping fee is 50 CHF per person for the whole event and 75 CHF per person for the whole event after the TMRF deadline.



- CH 2.3.6 Teams will receive an invoice for the team member and camping fee after the TMRF deadline. The fees must be paid within the deadline written on the invoice.
- CH 2.3.7 If the event will have to be cancelled due to external reasons before 2023-04-30 23:59 CEST, the registration fee will be refunded. If the event will have to be cancelled due to external reasons after 2022-04-30 23:59 CEST, the registration fee will only be refunded partly to cover the costs.

## **CH 2.4 Waiting List**

- CH 2.4.1 Teams on the waiting list may move to the participating list until 2022-06-26 18:00 CEST. This is possible if a registered team withdraws from the competition. Once a slot on the participating list has become available again, the next team on the waiting list will move to the pending list and has 2 days to pay the registration fee in order to move to the participating list. The 2 days start from the point of receiving the confirmation email. With answering the email, the time can be extended.
- CH 2.4.2 Teams on the waiting and participating lists who find that they will not be able to attend the competition are requested to officially withdraw by notifying the officials. (E-Mail to: [info@fsswitzerland.ch](mailto:info@fsswitzerland.ch))

## **CH 2.5 Team Member Registration Form (TMRF)**

- CH 2.5.1 The Team Member Registration Form has to be uploaded until the deadline (see CH 3.2). There will be a template on the website.
- CH 2.5.2 If there are changes to the Team Member Registration Form after the deadline, the whole Form has to be send to: [info@fsswitzerland.ch](mailto:info@fsswitzerland.ch)
- CH 2.5.3 With the TMRF a valid Health Insurance Certificate (HIC) for Switzerland (e.g. travel insurance) has to be attached.
- CH 2.5.4 All participants will get a personalized standard terms to the team address given at the creation of the team account. This document must be printed out, signed by the participant and brought to the on-site registration.

## **CH 2.6 Visa for Participants**

- CH 2.6.1 If your team or team members require a letter of invitation to obtain a VISA, please send an e-mail to [info@fsswitzerland.ch](mailto:info@fsswitzerland.ch)



## CH 3      Important Dates

### CH 3.1      Deadlines

- CH 3.1.1 All required documents and information must be uploaded prior to the following deadlines by all registered teams and teams on the waiting list. Documents may be uploaded starting with the announcement of the registration results.

Date	Deadline	Submission
2023-03-17 13:00	Impact Attenuator Data (IAD)	FSG Account
2023-03-17 13:00	Structural Equivalency 3D Model (SE3D)	FSG Account
2023-03-17 13:00	Structural Equivalency Spreadsheet (SES)	FSG Account
2023-03-31 13:00	Electrical System Form (ESF)	FSG Account
2023-03-31 13:00	Charger connector & power (CCP)	FSCH Teamaccount
2023-05-05 13:00	Team Member Registration Form (TMRF)	FSCH Teamaccount
2023-06-09 13:00	Business Plan Pitch Video(BPPV)	FSCH Teamaccount
2023-06-09 13:00	Design Spec Sheet (DSS)	FSCH Teamaccount
2023-06-09 13:00	Engineering Design Report (EDR)	FSCH Teamaccount
2023-06-23 13:00	Cost Report Documents (CRD)	FSCH Teamaccount

- CH 3.1.2 All documents uploaded at the FSCH Teamaccount must comply with a maximum size of 100 MB. For the uploads at the FSG Account, the limits of FSG apply.
- CH 3.1.3 Some documents, as indicated in CH 3.2.1, must be uploaded at the FSG Account. A FSG Account is required for all participating teams. Contact [info@fsswitzerland.ch](mailto:info@fsswitzerland.ch) if you are not registered at FSG. You will be added to the withdrawn list to be able to submit the documents.
- CH 3.1.4 The top 5 teams of the waiting list must submit IAD, SE3D, SES and ESF in order to remain on the waiting list. The team is responsible to monitor their position on the waiting list. As soon as a team moves to the participants list, they have 5 days to upload all other documents, that are already due.



## **CH 4      Competition Site Organization**

### **CH 4.1    Competition site**

- CH 4.1.1 The competition site consists of the competition area (event control, statics bays, team pits), the dynamic area (dynamics tracks, inspection area, accumulator tent), the social area and the camping area.
- CH 4.1.2 The social area is a place, where teams may build up a tent at a place assigned to them.
- CH 4.1.3 No Formula Student cars and parts are allowed at the social area and camping site.
- CH 4.1.4 It is prohibited to enter the competition site in intoxicated condition. The social area and the camping area is excluded from this rule. Checks will be performed to control this rule. A6.6.2 applies, if a team member tests positive.
- CH 4.1.5 The use of motorcycles, quads, bicycles, scooters, skateboards, kick boards or other similar devices as well as self propelled devices in general by team members and spectators is prohibited at the whole competition site.
- CH 4.1.6 Lost and found items must be picked up until Thursday 2023-07-06 10:00 CEST at event control.
- CH 4.1.7 Confiscated goods may be picked up after the end of the endurance and must be picked up until Thursday 2023-07-06 10:00 CEST at the event control.

### **CH 4.2    Entering the competition site**

- CH 4.2.1 Entering the competition site will be possible based on the time schedule published on the event website. The camping site is accessible during the whole event.
- CH 4.2.2 Teams are allowed to enter the pits and the accumulator tent between 06:00 and 22:00 every day.
- CH 4.2.3 Assembly of the teams pits will be possible from Friday 2022-06-30 based on a schedule published on the event website.
- CH 4.2.4 Disassembly of the team pits must be completed until 30 minutes before the scheduled start of the award ceremony. The pits must be empty and broom-clean.
- CH 4.2.5 Disassembly of the teams social area must be completed until Thursday 2023-07-06 10:00 CEST.
- CH 4.2.6 Other dates of arrival and departure may be accepted in special cases and after approval by the officials.

### **CH 4.3    Camping area**

- CH 4.3.1 The camping area is organized by Formula Student Switzerland and issues have to be communicated at the event control.
- CH 4.3.2 On the first day and last day, cars are allowed at the camping area for unloading and loading respectively. Parking is not allowed at the camping area. It is not allowed to drive on the grass with a car.



- CH 4.3.3 Only sleeping tents are allowed at the camping area. Bigger team tents are forbidden in the camping area.
- CH 4.3.4 The camping area is close to an inhabited area, which means that there is a night rest time from 24:00 - 6:00. Therefore, no loud music is allowed outside these hours (especially to wake up your team).

## **CH 4.4 Dynamic Area and Dynamic Vests**

- CH 4.4.1 Each team receives 4 dynamic vests. They must be returned at the event control until 30 minutes before the scheduled start of the award ceremony.
- CH 4.4.2 Charging area and inspection area are separate dynamic areas including separate entrance restrictions.
- CH 4.4.3 Only four members per team in total may enter any dynamic area at the same time. One of them must be an Electrical System Officer (ESO). They have to wear the dynamic vest in these areas. However, when working at the open accumulator, the vest must not be worn.
- CH 4.4.4 Inside the charging area, team members must not wear any conductive jewellery and must not wear any conductive objects of any kind which could touch the accumulator.

## **CH 4.5 Announcements**

- CH 4.5.1 Prior to the event all announcements will be by email. During the event all announcements will be on the competition website.

## **CH 4.6 Welding and Power Tools**

- CH 4.6.1 FS Switzerland provides a welding and power tool area. It is possible to weld with team equipment in the welding area only using appropriate safety gear.
- CH 4.6.2 The welding and power tool area will be supervised and can only be used during the announced opening hours.

## **CH 4.7 Team Briefing**

- CH 4.7.1 Briefing documents will be published each day on the competition website. There are no scheduled on-site team briefings.
- CH 4.7.2 If on-site briefings will be necessary, they will be announced at the competition website. Team captains must attend all on-site briefings.

## **CH 4.8 Technical Inspection Time Schedule**

- CH 4.8.1 Pre-inspection, accumulator inspection, mechanical inspection and electrical inspection will be conducted within a time schedule, where every team will get a predesignated time slot based on the registration quiz order. The time schedule will be published on the website before the start of the competition.



- CH 4.8.2 The length of these slots is 2 hours for accumulator inspection, 75 minutes for mechanical inspection, 40 minutes for pre-inspection and 2.5 hours for electrical inspection.
- CH 4.8.3 A team can enter the inspection bay 5 min in advance of the starting time.
- CH 4.8.4 After the end of a time slot a team has 5 min to clear the inspection bay for the next team.
- CH 4.8.5 Teams that are not able to attend an inspection slot must announce, that they need more time to prepare for technical inspection. A new time slot at the end of the inspection order will be assigned.
- CH 4.8.6 If a team shows up later than 15 min unannounced after the starting time of their slot, it will lose its time slot. The team has to queue for Re-Scrutineering to pass the inspection. Additionally 5 penalty points will be deducted from the teams overall score.

## **CH 4.9      Pre-Inspection**

- CH 4.9.1 Pre-Inspection and driver egress will be conducted in the pit, where the technical inspectors will visit the teams. During that time, only the drivers may be present.
- CH 4.9.2 Pre-inspection must be completed latest before the tilt test.
- CH 4.9.3 The driver egress is mandatory for all drivers. Before participating in a dynamic event, the driver must have passed the egress test.
- CH 4.9.4 By participating at the event, teams agree, that all equipment, which is classified unsafe by the officials will be confiscated until the end of the competition.

## **CH 4.10     Re-Inspection**

- CH 4.10.1 The mechanical and electrical re-inspection will take place in the technical inspection area and the accumulator re-inspection will take place in the accumulator tent.
- CH 4.10.2 Teams, that are ready for re-inspection must sign up at a list at the competition website.
- CH 4.10.3 Re-inspection slots are limited to 30 min duration. If more than 30 min are needed, the team must queue again for another re-inspection slot.
- CH 4.10.4 All teams must be fully ready, when applying for a re-inspection slot.

## **CH 4.11     Accumulator Inspection**

- CH 4.11.1 Accumulator inspection will take place in the accumulator tent.
- CH 4.11.2 All TS accumulators must be brought to the accumulator tent at a time announced by the event.
- CH 4.11.3 If a team misses the deadline, a penalty of 10 points is deducted of its overall score for every commenced 12 hours up to a maximum of 30 penalty points.
- CH 4.11.4 The team has to register the accumulator delivery at the accumulator tent.



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## **CH 5      Statics Events**

### **CH 5.1      Business Plan Presentation**

- CH 5.1.1      There will be Business Plan Presentation finals.
- CH 5.1.2      The Deep Dive Topic will be announced prior to the event.

### **CH 5.2      Cost and Manufacturing**

- CH 5.2.1      The system for DBOM (see S2.5) will be announced prior to the event.
- CH 5.2.2      The system for CBOM (see S2.6) will be announced prior to the event.

### **CH 5.3      Engineering Design**

- CH 5.3.1      There will be Engineering Design finals. Number of teams participating in the finals will be announced during the event.
- CH 5.3.2      There will be no category for autonomous functionality.



## CH 6 Dynamics Events

### CH 6.1 Skid Pad

- CH 6.1.1 Each team has four runs, driven by two drivers with two runs each. There will be no Driverless Skid Pad event.
- CH 6.1.2 3.5 points are awarded to every team that finishes at least one run without DNF or DQ.
- CH 6.1.3 If a team's best run time including penalties is below  $T_{max}$ , additional points based on the following formula are given:

$$SKIDPAD\_SCORE = 71.5 \left( \frac{\left( \frac{T_{max}}{T_{team}} \right)^2 - 1}{0.5625} \right)$$

$T_{team}$  is the team's best run time including penalties.

$T_{max}$  is 1.25 times the run time of the fastest vehicle including penalties.

### CH 6.2 Acceleration

- CH 6.2.1 Each team has four runs, driven by two drivers with two runs each. There will be no Driverless Acceleration event.
- CH 6.2.2 3.5 points are awarded to every team that finishes at least one run without DNF or DQ.
- CH 6.2.3 If a team's best time including penalties is below  $T_{max}$ , additional points based on the following formula are given:

$$ACCELERATION\_SCORE = 71.5 \left( \frac{\left( \frac{T_{max}}{T_{team}} - 1 \right)}{0.5} \right)$$

$T_{team}$  is the team's best time including penalties.

$T_{max}$  is 1.5 times the time of the fastest vehicle including penalties.

### CH 6.3 Endurance

- CH 6.3.1 Teams, that complete at least one lap but don't finish endurance or whose corrected elapsed time is over  $T_{max}$ , receive points based on the following formula:

$$ENDURANCE\_SCORE = 25 \left( \frac{n_{compl}}{n_{laps}} \right)$$

$n_{laps}$  is the number of laps of the whole endurance.

$n_{compl}$  is the teams number of completed laps.



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- CH 6.3.2 If a team finishes endurance without DNF and their corrected elapsed time is below  $T_{max}$ , points based on the following formula are given:

$$ENDURANCE\_SCORE = 25 + 300 \left( \frac{\frac{T_{max}}{T_{team}} - 1}{0.333} \right)$$

$T_{team}$  is the team's corrected elapsed time.

$T_{max}$  is 1.333 times the corrected elapsed time of the fastest vehicle.

- CH 6.3.3 No points are awarded to teams, that receive a DQ for the endurance event.