

INTERNATIONAL DESIGN COMPETITION FORMULA STUDENT NETHERLANDS

5

2017
YEARS
ANNIVERSARY
2022

2022 COMPETITION HANDBOOK



Competition Handbook 2022 v1.0

Content

NL1	General Information	3
NL2	Documents & Deadlines	8
NL3	Technical Inspection	12
NL4	Static Events	13
NL5	Dynamic Events	14

Changelog:

V1.0 | Release for publication

NL1 General Information

NL1.1 Competition Format & Organizer

Formula Student Netherlands 2022 (FSN22) will consist of two classes: Internal Combustion Vehicle (CV) Class and Electric Vehicle (EV) Class. Both classes can be identified as separate competitions with separated classifications. The competition will be open to:

- 35 CV Class teams
- 35 EV Class teams

The competition organizer is Tilt Works Events;

Tilt Works B.V.
Egersundweg 6
9723 JM
Groningen
The Netherlands

CoC: 66930308
VAT: NL856757226B01

NL1.2 Competition Dates and Place

FSN22 will be held from 9th until 14th of July 2022, at the TT Circuit in Assen, The Netherlands. Please refer to the time schedule for detailed timing.

Venue address:
TT Circuit
De Haar 9
9405 TE
Assen
The Netherlands

The official competition website is: www.formula-student.nl

NL1.3 Vehicle Shipping

All teams using an (external) shipping company or freight forwarder must coordinate the transport with the FSN Organization. Vehicles must arrive between July 6th and 8th and must be removed from the event site on July 14th before 18:00 CEST.

In regards to Brexit, additional logistic support for teams from the UK is available. This also applies for teams outside of the European Union.

Contact the FSN Team on info@formula-student.nl

NL1.4 Registration Fee & Campsite Fee

For FSN21, the registration fee includes 15 team members. Additional team members may be added for €20,- each until May 1st 2022. After this date, additional team members may be added for €50,- each. Team sizes may be limited by the event

organization, in that case all fees for additional team members will be 100% refunded.

For CV Class, the 2022 registration fee is €1850, including 9% VAT

For EV Class, the 2022 registration fee is €2150, including 9% VAT

The campsite fee is €700,- , including 9% VAT. Each team is required to reserve at least one campsite pitch with their registration which accommodates the first 15 team members. Additional pitches on the campsite may be booked for €700,- ,including 9% VAT. Spaces may be limited by the event organization.

Considering the volatile COVID-19 situation, all invoices for registration fees and campsite fees will be dated April 1st 2022 and due seven days later on April 8th 2022.

Payments for registration fees and campsite fees can only be made via bank transfer. In exceptional cases, credit card payments are accepted at a surcharge.

To confirm a team registration after the registration procedure as mentioned in NL1.5, a deposit of €200,- must be made via PayPal. The deposit will be returned after the event if the team returns their transponder and leaves their pit garage and campsite spot at the set times and in clean condition.

NL1.4.1 **Refund Policy**

In case the organizer cancels the event at any date before May 1st 2022, registration fees, campsite fees and deposits are 100% refundable.

In case the organizer cancels the event at any date after May 1st 2022 registration fees, campsite fees and deposits are 80% refundable.

In case a team cancels their participation for any reason, at any date, registration fees ,campsite fees and deposits are not refundable.

NL1.4.2 **VAT Policy & Reclamation of VAT**

The FSN organization is legally required to invoice VAT to all teams, regardless of the origin of the team. Teams with a valid EU VAT number may reclaim their VAT at the Dutch IRS [via this link](#). A direct 0% reverse charge is legally not possible.

NL1.5 **Registration Procedure**

Registration for FSN21 commences in two phases, a pre-registration procedure and a regular registration procedure. Registrations are subject to [general terms and conditions](#)

NL1.5.1 **Pre-Registration Procedure**

In the pre-registration procedure, starting on January 1st 2022, the top-5 finishers from FSN2021 from both classes are invited to participate in FSN22. Afterwards, all teams from the Netherlands, Belgium and Luxemburg (BeNeLux) are invited to the competition. Teams eligible for a position via the pre-registration procedure have until January 14th 2021 to confirm their entry by making the deposit as mentioned in NL1.4 via PayPal. These teams will receive communication about this procedure via their MyTeam account.

Eligible Teams

Teams eligible for this pre-registration procedure are:

Registration Slots: Top-5 EV

TU Dresden - Elbflorace
TU Eindhoven – University Racing Eindhoven
DHBW Stuttgart – DHBW Engineering Stuttgart
UAS Augsburg – StarkStrom Augsburg
ETH Zurich – AMZ electric

Registration Slots: Top-5 CV

UAS Graz – joanneum racing graz
TU Berlin – FaSTTUBe Combustion
TU Brno – TU Brno Racing
UAS Coburg – CAT-Racing
Uni Lund – Lund Formula Student

Registration Slots: BeNeLux EV

TU Delft – Formula Student Team Delft
KU Leuven & Thomas More – Formula Electric Belgium
VU Brussels – VUB Racing
UAS Groningen – Hanze Racing Division
UAS Zuyd – FUZE
UAS The Hague – The Formula Cruisers
UAS Rotterdam – Racing Team Rotterdam
U Gent – UGent Racing

Registration Slots: BeNeLux CV

UAS Arnhem – HAN Formula Student

NL1.5.2 **Regular Registration Procedure**

All remaining places in the competition will be available through the regular registration procedure.

The regular registration procedure consists of a quiz, to be held on January 28th 2022 at 17:00 CET. A button to enter the quiz will be displayed on the website on this date. Detailed information about the quiz procedure can be found in NL1.6

Note, in the unlikely case that the amount of team looking to compete in a class of the competition is smaller than the amount of available spots in that class, all places will be directly assigned without a quiz.

NL1.5.3 **Wildcards for Hybrid CV Class entries**

There will be up to 5 wildcards for FSN22 CV Class. Wildcards are part of the regular registration procedure. Only teams planning to run a hybrid car in CV Class in 2022 can apply for a wildcard. A team can apply for a wildcard by uploading their Hybrid System Description (HSD) via their FSN MyTeam account before January 21st 17:00 CET. The HSD does not have to be the final version and may be incomplete. Teams

that have applied for a wildcard must still participate in the registration quiz. Selected teams for a wildcard will be published in the final quiz results, see NL1.6.

NL1.5.4 **Team Accounts**

To be able to participate in FSN22, all teams must create an FSN MyTeam account on the competition website before January 24th 2022 23:59 CET. Team accounts can be created from December 13th 2022 09:00 CET. Verification of a team account may take up to 48 hours. Please note that 2021 accounts are not valid and will be removed from the database.

All teams must also have a valid FSG account for uploading files. It is mandatory to participate in the FSG2022 registration quiz to obtain a valid account. The result of the FSG quiz is not of importance (a team should at minimum be placed on the waiting or withdrawn list). See NL2 for more details.

NL1.6 **Registration Quiz**

The FSN22 registration quiz is part of the regular registration procedure for FSN22.

There will be separate quizzes for CV and EV Class, a quiz may contain class-specific questions. The quiz will consist of 8-20 questions. The quiz is designed in such a way that a well-prepared team should not spend longer than 90 minutes. The maximum time is 120 minutes.

All questions will be multiple-choice, only one answer is correct.

Questions may be asked about the FS Rules 2022, the FSN grey area clarification document, as well as general (engineering) practices and knowledge.

The amount of correct answers is considered first, before the time elapsed to complete the quiz. In other words, it is more important to be right than to be fast.

Time will be counted from 17:00 CET, regardless of the actual time a team starts the quiz.

Answers, Protests and Quiz Results

The answers to the quiz will be published at on January 28th 2021 19:00 CET on the competition website. Protests may be filed until two hours after the answers have been published. The final quiz results will be published as soon as possible after the protest window has elapsed and all protests have been dealt with.

All protests must be send to info@formula-student.nl . Protest that are send via other platforms will not be assessed. All protests must contain the team name, university name and a clear description of the protest.

NL1.7 **Team Members**

Every team must fill out a Team Member Registration Form (TMRF) prior to the competition. A format will be available on the competition website. Teams that list more than 15 members of the TMRF will receive an invoice for the extra team members as mentioned in NL1.4.

All individuals are responsible for their own Health Insurance, the FSN organization may perform random checks to ensure an individual has a valid health insurance.

If your team or team members require an invitational letter to obtain a VISA, please send an e-mail to info@formula-student.nl

NL1.7.1 Team Manager & Team Manager Meetings

Each team is required to assign one person as team manager. The team manager must attend all team manager meetings. A team manager is responsible for the distribution of official competition information as presented in the team manager meetings to their team. A handout of a team manager meeting will be available on the website after the meeting.

NL1.7.2 Team Member Designation

Depending on the applicable COVID-19 regulations, team members may be asked to be designated for specific areas and/or responsibilities.

NL1.8 Vehicle Numbers

All registered teams will be invited to choose a car number for the competition via their MyTeam account.

EV Class: 01-99, with an E added in front of the number.

CV Class: 101-999

Numbers E01 & 101 are reserved for the victors of each class from FSN2021.

NL1.9 COVID-19 Regulations & Restrictions

Due to the uncertainty of the COVID-19 pandemic, procedures and regulations as presented in this competition handbook might change.

NL2 Documents & Deadlines

NL2.1 Deadlines

<u>Date (yyyy/mm/dd)</u>	<u>Deadline</u>	<u>Class</u>
TBD	Electrical System Form (ESF)	EV
TBD	Hybrid System Description (HSD)	CV (Hybrid)
TBD	Impact Attenuator Data (IAD)	ALL
TBD	Structural Equivalency 3D Model (SE3D)	ALL
TBD	Structural Equivalency Spreadsheet (SES)	ALL
2022-04-01 13:00 CEST*	Fuel Type Order (FTO)	CV
TBD	SES Approval (SESA)	ALL
2022-05-01 13:00 CEST*	Magazine Uploads (MU)	ALL
2022-05-01 13:00 CEST*	Design Spec Sheet (DSS)	ALL
2022-05-01 13:00 CEST*	Team Member Registration Form (TMRF)	ALL
TBD	Business Plan Pitch Video (BPPV)	ALL
TBD	Engineering Design Report (EDR)	ALL
TBD*	Cost Report Documents (CRD)	ALL
TBD	Electrical System Officer Qualification (ESOO)	EV
2022-07-01 13:00 CEST*	Vehicle Status Video (VSV)	ALL

**different from FSG*

NL2.2 Documents

All teams must submit the documents mentioned in NL2.1 before the mentioned deadlines. A specific instruction on each document and how to submit is given in the following articles of the FSN21 Competition Handbook. All documents and deadlines are subject to section A5 of the 2022 Rules.

All documents must comply with a maximum of 40 MB. In any case, if a document upload fails. Please contact the FSN Team via info@formula-student.nl

NL2.2.1 Impact Attenuator Data (IAD)

IAD must be submitted in accordance to section T3.18 and T3.19 of the 2022 Rules

Format: See FSG website, PDF

Method of submission: [Upload file in FSG Account](#)

NL2.2.3 Structural Equivalency 3D Model (SE3D)

SE3D must be submitted in accordance to section T3.6 of the 2022 Rules

Format: IGES File (may be zipped)

Method of submission: Upload file in FSG Account

NL2.2.4 **Structural Equivalency Spreadsheet (SES)**

SES must be submitted in accordance to section T3.6 of the 2022 Rules

Format: See FSG Website (The FSAE-style SES is not allowed), xls(x)

Method of submission: Upload file in FSG Account

NL2.2.5 **Electrical System Form (ESF)**

ESF must be submitted in accordance to section EV9 of the 2022 Rules. Teams that are registered for FSG 2022 have the option to let their ESF be checked from FSG. All other EV Teams have to use the FSN ESF template on our homepage. The ESF has to be submitted to esf@formula-student.nl and the topic of the E-mail has to at least contain the team number.

Format: PDF, see template on FSN website.

Method of submission: Send ESF to esf@formula-student.nl

NL2.2.6 **Hybrid System Description (HSD)**

HSD must be submitted in accordance to section 7 of the FS Hybrid Rules 2022. All Hybrid Teams have to use the FSN HSD template on our homepage. The ESF has to be submitted to esf@formula-student.nl and the topic of the E-mail has to at least contain the team number.

Format: PDF, see template on FSN website.

Method of submission: Send HSD to esf@formula-student.nl

NL2.2.7 **SES Approval (SESA)**

Teams using a monocoque structure must submit a SESA in accordance to section A5.7 of the 2022 Rules

Format: PDF, see FSG website for template

Method of submission: Upload file in FSG Account

NL2.2.8 **Business Plan Pitch Video (BPPV)**

BPPV must be submitted in accordance to section S1.3 of the 2022 Rules. If the file is too large, please send a link to info@formula-student.nl

Format: common video format (avi, mpg, mp4, wmv)

Method of submission: Upload file in FSN MyTeam

NL2.2.9 **Design Spec Sheet (DSS)**

DSS must be submitted in accordance to section S3.3 of the 2022 Rules. For FSN, a template will be available on the competition website

Important note: the DSS deadline is expedited to include DSS details in the FSN2022 magazine. You are allowed to make changes to the DSS until the FSG deadline on without obtaining penalties. These changes will not be included in the magazine.

Format: xls(x)

Method of submission: Upload file in FSN MyTeam

NL2.2.10 **Engineering Design Report (EDR)**

EDR must be submitted in accordance to section S3.2 of the 2022 Rules

Format: PDF

Method of submission: Upload file in FSN MyTeam

NL2.2.11 **Magazine Uploads**

All teams are invited to write a description of their team (max 125 words). An isometric render or image with a neutral or no background of their 2022 vehicle must be added to the file.

All DSS data may be used to publish in the magazine. If a team fails to submit MU, the organizer may base a text on other available resources.

Format: DOC(X)

Method of submission: Upload file in FSN MyTeam

NL2.2.12 **Electrical System Officer Qualification (ESOQ)**

ESOQ must be submitted in accordance to section A4.8 of the 2022 Rules. An example of appropriate training is NEN 9140

Format: PDF(s)

Method of submission: Upload file(s) in FSN MyTeam

NL2.2.13 **Fuel Type Order**

CV Class teams will be invited to select a Fuel: RON98 or E85.

Format: Online form

Method of submission: Online FSN Form via FSN MyTeam

NL2.2.14 **Team Member Registration Form (TMRF)**

A TMRF must be submitted, including all participating team members. Faculty Advisors are not considered team members.

A format will be provided on the competition website.

Format: xls(x)

Method of submission: Upload file in FSN MyTeam

NL2.2.15 **Vehicle Status Video (VSV)**

VSV must be submitted in accordance to section A5.6 of the 2022 Rules.

Format: Any common video format (preferably .mp4)

Method of submission: Upload file in MyTeam, or send a link to info@formula-student.nl

NL2.2.16 **Cost Report Documents**

CRD must be submitted in accordance to section S2.3 of the 2022 Rules.

Teams must use the FSG online form to fill out the BOM, DBOM and CBOM and use the export function. The exported file must be uploaded via MyTeam to FSN.

For FSN21 a DBOM for the 'Suspension System' must be submitted*

For FSN21 a CBOM for the 'Electrical System' must be submitted*

*to be confirmed

Format: Exported FSG Online Form

Method of submission: Upload file in FSN MyTeam

NL3 Technical Inspection

NL3.1 Technical Inspection Order

The Technical Inspection Order (TIO), or scrutineering queue is based on the order of submission of vehicles status videos. A complete schedule will be published prior to the event or after all VSVs have been submitted.

CV Class:

TIO is only valid for the first attempt at mechanical scrutineering. If the order is in conflict with the static event schedule you may redeem your place in the queue at a later moment of your choice.

EV Class:

The TIO will be the basis for the assigning of the timeslots for Accumulator Inspection and Electrical Inspection.

NL3.2 Technical Inspection Procedure

The technical inspection procedure will take place in the scrutineering area.

Apart from Accumulator Inspection and Electrical Inspection, which use a system of timeslots, with rescrutineering timeslots, all inspection are based on a line-system without timeslots.

CV Class:

1. Mechanical Inspection, including pre-inspection
2. Driver Egress
 - Fuel
3. Tilt Test & Vehicle Weighing
4. Noise Test
5. Brake Test

EV Class:

1. Accumulator Inspection
2. Electrical Inspection
3. Mechanical Inspection, including pre-inspection
4. Driver Egress
5. Tilt Test & Vehicle Weighing
6. Rain Test
7. Brake Test

The Technical Inspection Procedure for Hybrid cars is still subject to discussion. More information will follow.

NL4 Static Events

NL4.1 Business Plan Presentation Event

The BPP event will be held according to section S1 of the 2022 FS Rules. A TV screen is available in each BPP room to use. Connection via HDMI cable.

Locations:

To be announced

NL4.1.1 Deep Dive Topic

To be announced

NL4.1.2 BPP Finals

The top 2-5 teams from each class will be invited for the BPP Finals

NL4.2 Cost & Manufacturing Event

The C&M event will be held according to section S2 of the 2022 FS Rules. Each team will have a back-to-back session for the Cost & Manufacturing and Engineering Design Event, with a 5 minute break in between to switch team members and equipment.

Both the C&M and ED Event take place in the Static Event Area, which is located near the scrutineering area. A 5m x 5m tent is provided for the team to present in. All walls are flexible material. A team should bring their own tape if they want to use the walls to hang any material.

NL4.2.1 C&M Finals

The top 2-5 teams from each class will be invited for the C&M Finals

NL4.3 Engineering Design Event

The ED event will be held according to section S3 of the 2022 FS Rules. Each team will have a back-to-back session for the Cost & Manufacturing and Engineering Design Event, with a 5 minute break in between to switch team members and equipment. A 5m x 5m tent is provided for the team to present in. All walls are flexible material. A team should bring their own tape if they want to use the walls to hang any material.

NL4.2.1 ED Finals

The top 2-5 teams from each class will be invited for the ED Finals

NL5 Dynamic Events

Please refer to section D of the 'Rules 2022'

All partaking drivers must attend the mandatory driver briefings. An online briefing may substitute the driver briefings.

NL5.1 Skid Pad Event

The Skid Pad Event will be held according to section D4 of the 'Rules 2020/2021'.

The Skid Pad will be made wet regardless of the weather conditions.

NL5.2 Acceleration Event

The Acceleration Event will be held according to section D5 of the 'Rules 2020/2021'. There is no "Top X Shoot-out".

NL5.3 Autocross Event

The Autocross Event will be held according to section D6 of the 'Rules 2020/2021'.

NL5.4 Endurance & Efficiency Event

The Endurance Event will be held according to section D7 of the 'Rules 2020/2021'.

A track map will be released prior to the competition

NL6

On Site Information

If you have an emergency that requires the police, fire department or an ambulance, you should call the emergency number 112. If you don't have an emergency, but you still need to contact the police, you can call: +31(0)9008844.

Always inform event officials about your emergency.

NL6.1

Campsite

All teams are required to use the on-site campsite facility. The campsite is located on the venue premises and allows for easy access to all venue facilities.

The campsite fee per campsite pitch is €700,- , including 9% VAT. Each team is required to reserve at least one campsite pitch with their registration which accommodates the first 15 team members. Additional pitches on the campsite may be booked for €700,- ,including 9% VAT. Spaces may be limited by the event organization.

The Campsite fee includes the use of campsite facilities such as power, drinking water, sinks, toilet facilities and shower facilities.

A campsite pitch is 10m x 10m. Pitches will be assigned to teams by the event organization, there is no free choice or first-come-first-serve system.

The arrival point (NL6.3) is considered part of the campsite.

Earliest arrival: July 9th 10:00 CEST

Latest departure: July 15th 12:00 CEST

NL6.1.1

Campsite Rules & Safety

No music speakers or devices with a total power over 20 W are allowed on the campsite at any time during the competition. Teams generating more noise may be excluded from the competition.

The use of motorcycles, quads, bicycles, scooters, skateboards or other similar mobility devices as well as self-propelled devices in general by team members and spectators is prohibited. Teams utilizing any of the listed mobility devices may be penalized

No vehicles are allowed on the campsite, except for loading and unloading on arrival and departure days. Campervans or caravans are not allowed. Teams with vehicles on the campsite on other days may be penalized.

The use of alcohol is allowed on the campsite. The use of drugs is prohibited. The use of drugs may lead to immediate exclusion from the competition.

Running Vehicles and working on vehicles on the campsite is strictly prohibited, except for the following operations:

- Cleaning
- Applying stickers/decals
- Changing rims and tyres
- Fitting and removing bodywork and aerodynamic devices

The use of power tools, running of tractive systems or work on high voltage systems may lead to immediate exclusion from the competition. Any other offense may lead to a penalty or immediate exclusion from the competition.

NL6.2 **Event Site**

The event site consists of all paddock areas, including the static event area, the scrutineering area, the pit garages, all dynamic event locations including spectator areas, the media centre, the business plan presentation rooms and the welcome centre.

NL6.2.1 **Event Site Rules & Safety**

The use of motorcycles, quads, bicycles, scooters, skateboards or other similar mobility devices as well as self-propelled devices in general by team members and spectators is prohibited. Teams utilizing any of the listed mobility devices may be penalized

No vehicles are allowed on the event site, except for loading and unloading during pit construction and deconstruction times. Teams with vehicles on the event site outside of these timeslots may be penalized.

The use of alcohol or any other drug is strictly prohibited. Team members may be asked to perform a breath analysis if doubts arise.

Running on the event site is prohibited

NL6.3 **Parking & Arrival Point**

Upon arriving at the venue, a team must proceed first to the Arrival Point. An official will guide you to the campsite from the Arrival Point, this process must be coordinated due to limited access roads on the campsite. After unloading campsite gear on the campsite, smaller vehicles such as cars can be parked on the adjacent grass parking. Heavier vehicles, such as trucks or trailers should proceed back to the arrival point for temporary parking until the event site opens. Heavy vehicles may be parked on the event site, close to the team pit garage once pit garage construction has commenced.

NL6.5 **Pit Garages**

All teams will have access to a pit garage on the event site. A standard 6x12m pit garage is shared amongst two teams. Therefore each team has approx. 6x6m of space available in their pit garage. A list of pit garage allocations will be published before the event on the competition website

NL6.6 **Media Centre**

Depending on the applicable COVID-19 regulations at time of the event, the media centre will be available. More information will follow closer to the event.

NL6.7 **Team Manager Meetings**

Team Managers are required to attend Team Manager Meetings (TMM) as mentioned in NL1.7.1. Team Manager Meetings will take place in the Media Centre. Please see the time schedule for exact times.

- NL6.8 **Driver Briefings**
- Driver Briefings will take place in the Media Centre. A separate briefing will be organized for each dynamic event. Please see the time schedule for exact times. Depending on room availability, driver briefings might be combined for different dynamic events.
- NL6.9 **Warnings & Penalties**
- Any violation of the rules may lead to a warning or penalty. Warnings can be issued in writing or verbally by event officials. Any penalties will be issued in writing and will be published publicly after the event.
- NL6.10 **Grandstand & Visitors**
- More information will follow closer to the event. Depending on the applicable COVID-19 regulations at time of the event.
- NL6.11 **Live Streaming & Timing**
- Live streaming will be available via YouTube. All dynamic event will be live streamed. Live timing is available through the MyLaps Speedhive app.
- NL6.12 **Dynamic Event Queeing**
- More information will follow closer to the event. Depending on the applicable COVID-19 regulations at time of the event.
- NL6.13 **Event Photo**
- All teams are required to attend the event photo. Final timing and instructions will be published before the event
- NL6.14 **Endurance Running Order**
- The endurance running order is based on the Autocross timings. Teams without a valid time in autocross can apply for a starting slot in the endurance event.
- NL6.15 **Fuel Station**
- Please refer to the time schedule for opening times.
- NL6.16 **Dataloggers**
- For FSN22, the 'FS East' datalogger will be used. More information will follow closer to the event.