



VDE E-Race

Formula Student Norddeutschland

Schwedt/Oder

12. - 15. June 2025

Version 1.0

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Changelog

This section contains only the major changes of the rules' intentions. Changed wording will not be displayed.

We recommend reading through all the rules anyway to ensure that mistakes are avoided.

Chapter	Version	Release Date	Change
-	1.0	28.01.2025	Initial release
1.2	1.1	06.04.2025	Extended Team Member Registration deadline
1.2	1.1	06.04.2025	Removed Registration Fee Payment deadline
2.4	1.1	06.04.2025	Removed Registration Fee Payment deadline

0 Contact

If there are any questions regarding the event, please visit our homepage (www.erace-v.de) or contact us via e-mail: info@erace-v.de.

1 General Information

The VDE E-Race is a Formula Student style, international design competition which takes place in Northern Germany every year.

The main target of the VDE E-Race is to give the participating teams the possibility of advanced preparation for the official Formula Student events in summer. Therefore, we offer static and dynamic events, where teams can test their skills, receive professional feedback, compare themselves to others, and gather experience. Additional “mini games” during the event help to strengthen the network between the participants of different teams. Wait and see!.

Check our website (www.erace-v.de) and follow us on social media (@vde_erace) to stay up to date if any changes in the schedule or the rules are made.

Every team is responsible for meeting the competition deadlines.

The official event language is English.

1.1 Location and Date

The VDE E-Race takes place in Schwedt/Oder (Germany) from 12 June 2025 to 15 June 2025. For detailed information about the location see [Directions](#) and [Site plans](#).

1.2 Important Dates

The following table provides an overview over important dates and deadlines for the VDE E-Race 2025.

Start	End	Designation	Rule
Registration Deadlines			
14.02.2025	09.03.2025	Team Registration	Team Registration
-	13.03.2025	Publication of Registration Results	Team Registration
-	22.03.2025	Registration Fee Payment	Registration Fee
23.03.2025	12.04.2025	Main Team Member Registration	Team Member Registration
-	19.04.2025	Additional Registration Fee Payment	Registration Fee
12.04.2025	01.06.2025	Late Team Member Registration	Team Member Registration
-	11.06.2025	Late Registration Fee Payment	Registration Fee
Competition Deadlines			
-	01.06.2025	Statics Document Upload	Static Events

Note: All information about a certain deadline can be found in the rules. The deadline time is 13:00 CET between 1 January 2025 and 30 March 2025 and 13:00 CEST between 31 March 2025 and 26 October 2025.

1.3 Directions

Address Event Site

Harbor of Schwedt
Neuer Hafen
16303 Schwedt/Oder
Germany

Address Campground and Pit Area

Regattastraße 1
16303 Schwedt/Oder
Deutschland

1.4 Event Schedule

The following section should provide a rough idea of the event schedule and how the different disciplines are distributed over the days. A detailed event schedule will be published in an additional document shortly before the event.

Thursday

- Start of the event (around noon)
- On-site registration (first 3 hours of the event)
- Technical Inspection (afternoon and evening)
- Engineering Design Event (afternoon and evening)
- Cost and Manufacturing Event (afternoon and evening)

Friday

- Engineering Design Event (whole day)
- Cost and Manufacturing Event (whole day)
- Business Plan Presentation (whole day)
- Technical Inspection (whole day)
- Acceleration [DV] (evening)
- Night Acceleration [DM] (evening)

Saturday

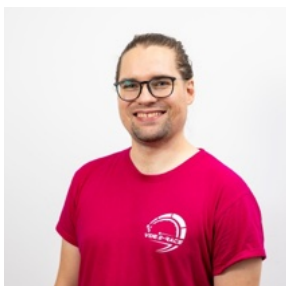
- Engineering Design Event (morning)
- Skid Pad [DM/DV] (morning)
- AutoX [DM/DV] (afternoon)
- Track Drive [DV] (afternoon)
- Endurance [DM] (afternoon)

Sunday

- Clean up (morning)
- Departure (around noon)

The pits at the campsite will be open 24 hours but the dynamic area at the harbor will be closed for the time when no dynamic events are scheduled.

1.5 Officials



Carl Johann Giest
General Coordination



Nicole Geier
General Coordination



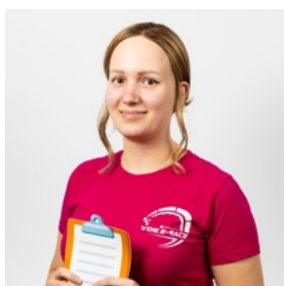
Janine Alt
General Coordination / IT



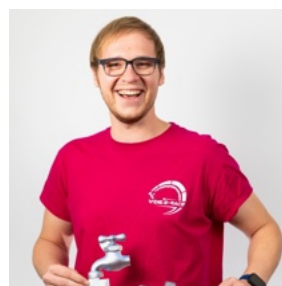
Inès Tchimou
Event Support / Statics



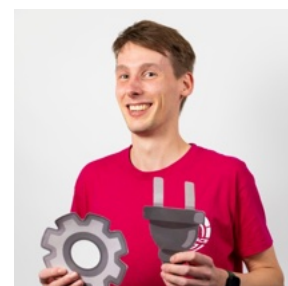
Jenny Stratmann
Statics



Hanna Werner
Statics



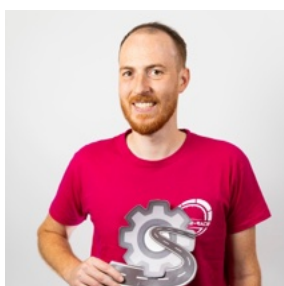
Jannek Alpen
Event Infrastructure



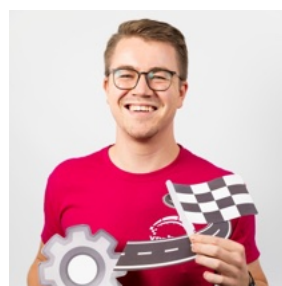
Torge Möller
Event Infrastructure



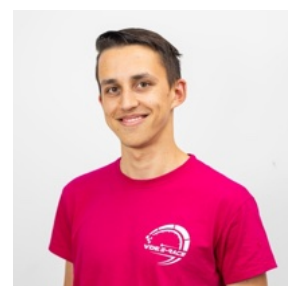
Tom Westendorff
TI / Dynamics



Victor Lubkowitz
TI / Dynamics



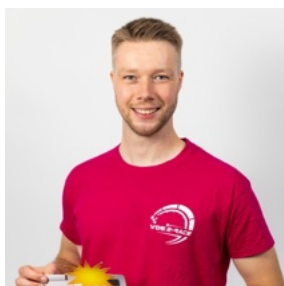
Bjarne Schwarz
TI / Dynamics



Christian Schappmann
TI / Dynamics



Anne Walther
Marketing / PR



Timon Suhk
Marketing / PR



Lukas Krebs
External Relations

1.5.1 Event Control

There will be no central event control, which is available all the time. Instead everyone who is wearing a pink shirt may be approached to ask general questions. If there are specific questions e. g. concerning specific disciplines, try to find a pink shirt who is responsible for this context.

2 Registration

2.1 Teams

The event is limited to 10 active (DriverMore + DriverLess) and 3 alumni (DriverOld) teams.

The active teams should aim to participate with their current car and take part in all static and dynamic events.

The alumni teams only participate in the dynamic events. Alumni team members are welcome to support the judging of the static events.

Category	Drivetrain	Number
DriverMore [DM]	EV / CV	10
DriverLess [DV]	EV	
DriverOld [DOld]	EV / CV	3

2.2 Team Registration

Teams register for the event on our homepage (www.erace-v.de) during the *Team Registration* period defined in section [Important Dates](#) of the VDE E-Race rules.

The registration slots will be assigned in the following order:

- VDE Teams
- VDE Supporters
- Other Teams (based on first come first served principle)

The option to register a team will be available on the competition website as soon as the registration period starts. As mentioned before, it is recommended to register quickly after the start of the registration, as slots are limited and order is partly based on first come first served principle.

After submission, the application will be checked by the officials and the team may appear on the competition website.

Every team has to indicate how many team members they intend to participate with in the VDE E-Race (see [Team Member Limit](#)).

On the date of *Publication Of Registration Results*, we will inform all teams who filled in the registration form within the given period about the state of their registration through their provided contact e-mail address. If the number of registrations exceeds available slots we will open a waiting list. We might also publish the results on the competition website and on social media.

All accepted teams will receive an invoice for the registration fee soon after the end of the team registration period. The registration fee (see [Registration Fee](#)) has to be paid until the *Registration Fee Payment* deadline defined in section [Important Dates](#) of the VDE E-Race rules. If a team fails to pay the correct amount within the given time, the team will be withdrawn from the competition and the first team on the waiting list will receive the slot.

The withdrawn team can request to be registered again and might then be added to the end of the waiting list.

2.3 Team Member Registration

Team members must register themselves on the competition website. In the registration process, each person is asked to choose their team. The list of registered team members will be accessible via an individual link provided to the team's contact e-mail address.

It is the responsibility of each team to regularly check the list of registered team members and inform the officials (info@erace-v.de) if there are any false registrations.

The registration period for team members is split into the main registration and the late registration period. The times of these periods are given as *Main Team Member Registration* and *Late Team Member Registration* in section [Important Dates](#) of the VDE E-Race rules.

2.3.1 Team Member Limit

We have to limit the number of participants to 250 due to the infrastructure on site. As there are larger and smaller teams, we do not want to set a fixed maximum number of team members per team. Instead, every team is required to provide an estimation on how many of their team members are planning to attend the event. This estimation has to be provided during [Team Registration](#).

Based on the estimations of all teams, the officials will define a fair amount of team member slots for each team. All participating teams will be informed about their individual number of slots in the *Announcement Of Registration Results* e-mail. If a team from the waiting list is moving forward to be registered, it will get the same amount of slots as the withdrawn team.

2.4 Registration Fee

The registration fee for the VDE E-Race is € 15,00 p. p. for VDE members and € 30,00 p. p. for non-members (minimum € 150,00 per team).

Based on these amounts, an individual registration fee is calculated for every team. ~~As soon as the team registration is over, every registered team has to pay an initial registration fee of € 150,00 until the Registration Fee Payment given in [Important Dates](#).~~

~~Teams on the waiting list have to pay their fee as soon as they are moved to be registered.~~

As soon as the main team member registration period is over, the individual registration fee of every team is calculated. The registration fee to be paid is the result of the calculation based on registered team members or € 150,00, whichever is higher. It has to be paid until the *Additional Registration Fee Payment* deadline given in [Important Dates](#). ~~If this fee is higher than € 150,00, an additional invoice covering the additional registration fee is sent to the team and has to be paid until the Additional Registration Fee Payment deadline given in [Important Dates](#).~~

The registration fee for team members registered during the *Late Team Member Registration* period given in [Important Dates](#) is € 50,00 regardless of the membership state in the VDE. So it is really recommended to meet this deadline of the *Main Team Member Registration*. If there are late registrations for a team, it will receive an additional invoice which has to be paid until the *Late Registration Fee Payment* which is set to the start of the competition.

It is allowed to exchange team members during the *Late Team Member Registration* period without additional costs. To request an exchange, contact the officials via info@erace-v.de.

The following examples illustrate the calculation of the individual registration fees:

Example 1: A team registers 20 VDE members (€ 300,00) and 5 non-members (€ 150,00) → This team has to pay € 150,00 after the *Team Registration (Registration Fee Payment)* and € 300,00 after the *Main Team Member Registration (Additional Registration Fee Payment)*.

Example 2: A team registers 10 VDE members (€ 150,00) → This team has to pay € 150,00 after the *Team Registration (Registration Fee Payment)*.

Example 3: A team registers 5 VDE members (€ 75,00) → This team has to pay € 150,00 after the *Team Registration (Registration Fee Payment)* (there will be no refund).

Example 4: A team registers 10 VDE members (€ 150,00) and 5 non-members (€ 150,00) and additionally 2 VDE members and 3 non-members during *Late Team Member Registration* (€ 250,00) → This team has to pay € 150,00 after the *Main Team Registration* (Registration Fee Payment) and € 300,00 after the *Main Team Member Registration* (Additional Registration Fee Payment) and € 250,00 after the *Late Team Member Registration* (Late Registration Fee Payment).

Registration period	Fee	Corresponding Payment Deadline
Team registration	€ 150,00 per team	Registration Fee Payment
Main Team Member Registration	€ 15,00 per VDE member € 30,00 per non-member	Additional Registration Fee Payment
Late Team Member Registration	€ 50,00 per person	Late Registration Fee Payment

Note: VDE membership is only available for people living in Germany. International teams please contact the officials before the *Main Team Member Registration* period to figure out a suitable solution (info@erace-v.de).

There will be no refunds of any registration fee for any reason. Late payment may cause losing the guaranteed starting place and being listed at the end of the waiting list.

2.5 On-Site Registration

On-site registration takes place at the event control and is possible during the first 3 hours on the first day of the competition (usually Thursday). Only the Team Captain or his/her deputy will be able to register the team. Make sure to bring the VDE E-Race consent form, duly signed by all registered team members.

At the event control, every team will receive a VDE E-Race Event Package including registration passes, dynamic area passes, static event documents etc. Large teams may bring one or two extra people to help carry.

2.6 ESO / ASR Assignment

Each team has the possibility to register as many ESOs / ASRs as they want. It is recommended to register all ESOs and ASRs during on-site registration. In general, a late registration is possible, but the availability of the responsible pink shirts might be limited during the event. At registration, all ESOs / ASRs must show a proof of qualification according to current Formula Student rules.

Each EV team has to register at least one ESO.

Each DV team has to register at least one ASR.

If there is only one ESO / ASR in a team, this person must not be a driver.

2.7 Driver Assignment

Each DM team has to register a minimum of 4 drivers and a maximum of 6 drivers to compete in the dynamic disciplines. Additional drivers can be registered to drive the car on the test track (these are not allowed to participate in the official disciplines).

DV teams have to register a driver for the manual brake test and if they want to go in manual mode on the test track.

It is recommended to register all drivers during on site registration. In general, a late registration is possible but the availability of the responsible pink shirts might be limited during the event. Drivers need to bring their student ID and driver's license for registration. Drivers of DOLD teams only need to bring their driver's license.

3 General Rules

3.1 General Technical Requirements

Every team must bring a self-constructed single-seated race car in order to participate in the competition.

Every participating vehicle must be built according to FSAE or Formula Student rules (valid in the year when the vehicle first participated in an official event). It must pass the technical inspection, before it is allowed to drive on the test track and participate in the dynamic events.

We strongly recommend participating with the current vehicle (even if it is not finished and ready to race) to get the maximum experience and benefit out of this pre-event - especially through the feedback on static events and technical inspection.

3.2 Competition Categories

There will be three competition categories at the VDE E-Race:

- DriverMore [DM]
- DriverLess [DV]
- DriverOld [DOld]

In general, the purpose of the competition is to prepare teams and their current vehicles for the official competitions later in the season. However, it is also possible to join the event with an older car and get feedback and training on Static Events and Technical Inspection. All disciplines taken with a non-first-year vehicle may be scored in the DriverOld category.

3.2.1 DriverMore

The Drivermore category is open for first year vehicles built according to the EV / CV sections of the current version of the Formula Student rules. At the VDE E-Race, EV and CV cars will be scored together in this category.

All cars which have not participated in an official World Ranking List Formula Student event (see <https://www.formulastudent.de/world/competitions/>) are considered to be first year vehicles.

3.2.2 DriverLess

The Driverless category is equivalent to the Driverless Cup. This means that you take part in the DV and DM disciplines with *the same* car.

3.2.3 DriverOld

The DriverOld category is meant to encourage alumni to experience the joy of VDE E-Race and “*show the young jumpers how the rabbit is running*”. Because as we all know: “*Earlier was everything better*”.

If you are interested in joining the VDE E-Race with your alumni team, feel free to contact us via e-mail at info@erace-v.de. It is much appreciated when participating alumni teams support us in judging the static events and technical inspection.

3.3 Charging and Working on the car

There will be a charging area where the HV accumulators can be charged. The charging area will be available on a regular basis during the day and in special cases on request.

If the tractive system is activated in the pit, all necessary safety precautions have to be met. This includes closing the pit with suitable caution tape to reduce the number of people in the pit to a minimum and to lift all driven wheels from the ground and remove the tires.

It is only allowed to open the accumulator in the charging area during the opening hours. This must be supervised by an official. Violating this rule will lead to the disqualification of the whole team.

3.4 Team Captains, Drivers, and ESO / ASR Briefings

The team captains, drivers, and ESO / ASR briefing will take place every morning.

This briefing is mandatory for all team captains, ESOs, and ASRs who are responsible for the car on that particular day (no matter if it is for statics, dynamic events or technical inspection). It is also mandatory for all drivers who want to drive the car on the test area or during dynamics on that day.

Drivers, ESOs, and ASRs who do not attend the briefing or arrive late, are not allowed to operate the car in Technical Inspection, dynamic disciplines and on the test track for that particular day.

3.5 General Guidelines

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

All team members are required to cooperate with and follow all instructions of the officials. Official announcements shall be considered part of these rules.

All guidelines and clarifications posted in the *Rules and Important Documents* sections on the competition website for the current season are considered part of the rules.

Questions concerning the meaning or intent of the rules will be resolved by the officials.

3.5.1 Alcohol

Alcohol, cannabis, or any other recreational drugs are strictly forbidden at the harbor and in the pit area (this includes the pits of other teams).

Consuming alcohol, cannabis, or other legal recreational drugs is only allowed in the social area on the campground. You are not allowed to bring them to the pit area and the harbor – even if they are inside your body. Illegal drugs are banned on the complete event.

Along with the fun, we want a safe competition. Therefore, we might conduct alcohol testing (breathalyzers) during the event. The permitted alcohol level in the aforementioned areas for any participant is 0 ‰. Every team member tested with an alcohol level higher than 0 ‰ in the pit area or at the harbor will lead to a penalty for the whole team which is determined by the officials. A second team member of the same team tested with more than 0 ‰ in these areas will lead to the disqualification of the team.

3.5.2 Smoking

Smoking (including Shisha) is only allowed in designated smoking areas. These will be announced during the welcome ceremony.

3.5.3 Pit and Dynamics Ground Conditions

It is the responsibility of every team to leave the pit ground in the same or a better condition as it was in the beginning of the competition. It is required that no dirt or fluids leave residues on the ground and that the nearby river does not get contaminated by any kind of fluids like oil,

degreaser or brake fluids. Therefore, it might be required to cover the pit ground with a suitable underlay. Any accidents or contaminants should be directly removed and reported to the officials.

The same requirements are valid for the condition of the dynamic area. If a car is losing fluids anywhere at the harbor, it is the team's responsibility to clean up the contaminated area and to take actions to prevent leakage in the future.

3.5.4 Harbor

It is strictly forbidden to enter the water at and around the harbor. It is not allowed to dispose of any kind of waste into the water.

For your own safety, you are not allowed to climb any kind of harbor equipment (like cranes) and lanterns.

A violation of the rule will lead to a disqualification of the whole team.

4 Technical Inspection

The Technical Inspection at the VDE E-Race will be according to Formula Student rules and aims to prepare all teams for the requirements at the official events. Therefore, it is recommended to participate with the current car to gather some valuable feedback from official scrutineers.

4.1 General Information and Procedure

The Technical Inspection will be held according to Formula Student rules and specifications. Every car needs to pass the Technical Inspection successfully in order to participate in the dynamic events. Every car must pass the Technical Inspection according to the rules which applied when the car was built, even if the car already passed a Formula Student Technical Inspection. The team must bring a printed copy of the FSG or FSA inspection sheet valid for the respective vehicle (DIN A4, printed on one side, stapled together at the top left) to the Technical Inspection.

The Technical Inspection order is first come, first serve.

The Technical Inspection will take place in the pits.

If you want to start the Technical Inspection, your car must be in ready-to-race condition. Besides that, a maximum of four team members and the inspection sheet need to be present.

It is also recommended to have the rules in print version as well as an electrical device with search function since these may help you to pass the Technical Inspection faster. You should also prepare all the necessary documents (printed or digitally) to prove that the vehicle is built in accordance with current rules. Particular attention should be paid to the documentation of solutions that are difficult or impossible to check during the inspection.

You will receive event stickers when all parts of the Technical Inspection are passed to allow quick checks in the dynamic area. The main sticker will have the following dimensions: 50 mm height x 150 mm length. You have to place it somewhere next to the driver's compartment where it is clearly visible while standing next to the car.

4.2 Special aspects of technical inspection at the VDE E-Race

You may pass the technical inspection and compete in the dynamic events of the VDE E-Race or use the test area without your vehicle fully complying with the rules. The technical inspector

decides whether a vehicle is in a technical condition that allows it to be operated at the event. If a team decides not to correct all rule deviations classified as non-critical by the technical inspector during the event, this has the following consequences:

- To ensure a fair competition, for every missing point in the inspection sheet there will be 5 points deducted from the team's overall scoring.
- The technical approval sticker is punched in the center.

All points concerning the brake system, driver safety, TSAL, and drive train will be handled very strictly.

Certain failures discovered during the inspection might be accepted by the VDE E-Race. That means, even if you pass Technical Inspection at this event, you may fail at other competitions.

4.3 Order of technical checks

CV:

- Mechanical Inspection
- Weight (maybe Tilt)
- Noise
- Brake

EV: You are supposed to go for electrical inspection first but you are allowed to start with mechanical inspection. In this case, the high voltage accumulator must be in the car, but must not be connected. Thus, different points need to be checked twice. We will only offer this, if it is necessary in case of time problems. The standard order is:

- Electrical inspection – maybe accumulator check (decision pending)
- Mechanical inspection
- Weight (maybe tilt)
- Rain
- Brake

DV: Please have your vehicle checked in the order of your drive train (CV / EV). Subsequently, the function of the driverless system is inspected. The following tests need to be passed:

- Autonomous System Inspection
- EBS

4.4 Tilt test

If a tilt test setup will be available at the event, will be announced in a later version.

4.5 Rain test

Every EV team has to pass the rain test to participate in the dynamics without disadvantages.

If the weather conditions are very good, it might be allowed to participate in the dynamics, even if the rain test is not passed. Skipping the rain test needs to be requested of the officials. If that request is approved and no rain test is carried out, the following restrictions apply to ensure a safe and fair competition:

- 25 points will be deducted from the team's overall dynamic scoring.
- The officials monitor the weather situation and will stop the car whenever they assess the risk of rain too high (latest as soon as the track is declared damp/wet).
- If the car is stopped during a dynamic discipline, the current run is scored DNF and no re-run will be granted.
- If the car is operated on the test track, it is the ESO's responsibility to stop the car as soon as it starts to rain.

5 Static Events

5.1 General Information (Statics)

As the aim of the E-Race is to prepare you as well as possible for the Formula Student events, we put a special focus on the Statics. That's why the points distribution for the Statics is relatively higher, so it pays off even more to be prepared (see [Scoring](#)).

In case of any questions, you can reach out to the Static team via e-mail (statics@erace-v.de).

Note: Teams not competing in the dynamics with a first year vehicle may still present Statics in accordance with their first year vehicle to receive some feedback or may use the time for a detailed Q&A session with the judges. Contact the officials **before** the competition to plan the session accordingly.

5.2 Business Plan Presentation

5.2.1 Objective

The objective of the Business Plan Presentation (BPP) is to evaluate the team's ability to develop and deliver a comprehensive business model showing how their product could become a rewarding business opportunity. The judges should be treated as if they were potential investors or partners for the presented business model. The business plan must relate to the specific prototype race car entered in the competition. The actual quality of the prototype itself will not be considered part of the BPP judging..

The BPP at the VDE E-Race will be slightly different from the official Formula Student events. The most important change is that there is **no** Deep Dive Topic for the BPP. Due to that, the presentation time is only 8 minutes.

You can use any presentation tool you want. We will provide a projector or display with an HDMI or VGA port, so make sure you are prepared for both. Before your presentation starts, please check if all of your devices are compatible with the given equipment. Teams planning to use other presentation equipment are responsible for bringing it themselves.

5.2.2 Business Plan Pitch Video

The Business Plan Pitch Video (BPPV) is requested and must not exceed a length of 30 seconds. All other parameters can be found in the FSG Rules (Formula Student Rules – S 2.3.).

As soon as the team registration phase is closed and it is published who will be taking part in this year's VDE E-Race, the form for uploading the BPPV will be published. Submit it through the form (using [this link](#)) by the *Statics Document Upload* deadline specified in the section [Important Dates](#). In case of problems with the form, send a request via e-mail to statics@erace-v.de.

We try to provide feedback for late submitted documents but to guarantee a fair competition, you will receive zero points for the *Pitch Video* (see [Static Events Scoring](#)).

5.2.3 Procedure

Presentations are limited to a maximum of 8 min. After watching the Pitch Video (see [Business Plan Pitch Video](#)) together, the presentation will start and will not be interrupted by questions. There will be a question and answer session immediately following the presentation.

One or more team members may present the business concept. All team members involved in the BPP must be in the podium area and must be introduced to the judges at the beginning of the presentation. Team members who have been introduced, may answer the judges' questions even if they were not presenting.

Teams that fail to make their presentation during their assigned time period, will receive zero points for the BPP and get a penalty (see [Static Events Penalties](#)).

It will be possible to bring additional team members (from your team or another) to see the presentation and take notes.

5.3 Engineering Design Event

5.3.1 Objective

The concept of the design event is to evaluate the students' engineering process and the effort that went into the design of a vehicle, meeting the intent of the competition (Formula Student Rules – S 3.1.).

5.3.2 Engineering Design Documents

As soon as the team registration phase is closed and it is published who will be taking part in this year's VDE E-Race, the form for uploading the Engineering Design Report (EDR) and the Design Spec Sheet (DSS) (according to Formula Student Rules – S3) will be published. Submit it through the form (using [this link](#)) by the *Statics Document Upload* deadline specified in the section

[Important Dates](#). In case of problems with the form send a request via e-mail to statics@erace-v.de.

We try to provide feedback for late submitted documents, but to guarantee a fair competition you will receive zero points for the *EDR* (see [Static Events Scoring](#)).

5.3.3 Content

The engineering design event at the VDE E-Race will be similar to the one at the official Formula Student Events (Formula Student Rules – S3). Prepare everything as you would do it for any other event. Bring supporting material like drawings, pictures, videos, and similar to support your arguments and to visualize your design process to the judges.

5.3.4 Procedure

The engineering design event will take place in the pits.

You will present your construction and design decisions to the judges next to the race car. In a question-answer-discussion they evaluate the design process of the race car. The discussion is limited to a maximum of forty minutes.

After the discussion you will get a short feedback and some hints on how you can improve for the upcoming events.

5.4 Cost and Manufacturing Event

5.4.1 Objective

The objective of this discipline is to evaluate the team's understanding of the manufacturing processes, costs and greenhouse gas emissions associated with the construction of a prototype vehicle. This includes trade off decisions between content and cost, make or buy decisions and understanding the differences between prototype and mass production (Formula Student Rules - S 3.1.1).

5.4.2 Cost Report Documents

All Cost Report documents (BOM including CCBOM), supporting material file and cost explanation file are required for participating in this event. BOM and CCBOM should be created with the FSG Cost tool online and exported as pdf.

As soon as the team registration phase is closed and it is published who will be taking part in this year's VDE E-Race, the form for uploading the documents will be published. Submit them through the form (using [this link](#)) by the *Statics Document Upload* deadline specified in the section [Important Dates](#). In case of problems with the form send a request via e-mail to statics@erace-v.de.

We try to provide feedback for late submitted documents, but to guarantee a fair competition you will receive zero points for the *BOM and BOM discussion* (see [Static Events Scoring](#)).

5.4.3 Content

The cost and manufacturing event at the VDE E-Race will be similar to the one at the official Formula Student Events (Formula Student Rules – S 3.2). Therefore, we ask you to prepare yourselves as you would do it for every other judging. The systems for the CCBOM are defined in the Formula Student Rules, see S 3.5.2.

5.4.4 Procedure

The cost and manufacturing event will take place in the pits. You will present your BOM and manufacturing decisions to two judging groups next to the race car. In a question-answer-discussion they evaluate the manufacturing process of the race car.

After the discussion you will get a short feedback and some hints how you can improve for the upcoming events.

6 Dynamic Events

The dynamic events will take place in the dynamic area. Every aspect that is not specifically defined in the following section will be conducted according to the current Formula Student rules.

6.1 Access to Dynamic Area

Access to the dynamic area is only allowed to a limited number of participants per team. Every team will receive four dynamic area passes. With these passes four team members may enter the dynamic area.

Drivers may take them off while sitting in the car and give them to another team member already wearing a pass.

6.2 Testing

Testing is only allowed in the testing area after passing the Technical Inspection.

If the tractive system is activated or the IC engine is fired up in the pit lane, make sure that all necessary safety precautions are met as stated in section [Charging and Working on the car](#).

6.3 Dynamic Disciplines

The following dynamic disciplines will be part of the VDE E-Race:

Dynamic discipline	Category
Acceleration	[DM] / [DV] / [DOld]
Skid Pad	[DM] / [DV] / [DOld]
AutoX	[DM] / [DV] / [DOld]
Endurance	[DM] / [DOld]
Trackdrive	[DV]
Efficiency (optional)	[DM] / [DV]

The running order for the Endurance and Trackdrive events will depend on the results in the AutoX event.

According to Formula Student Rules, the points scored in autonomous Skid Pad and Acceleration will also count into DM overall result.

There may be an Efficiency scoring at the VDE E-Race. This depends on the availability of official Energy Meters according to FSG specifications. If they are available at that time, they will be used. So please consider the space and connections in your car.

Notes on the discipline Acceleration: For driverless vehicles (DV), the discipline is held in the early evening so that daylight conditions prevail.

For vehicles with drivers (DM), the discipline takes place during sunset. Sufficient lighting will be provided so that the discipline can be carried out safely. As last year, we are once again appealing to your creativity at this point. A night race is based on an interesting light show. So think back to your tuning time at *Need for Speed* and show everyone how a vehicle is displayed properly. No permanent modifications or additional elements may be installed after Technical Inspection. To ensure that these modifications do not endanger drivers or track marshals, have them briefly checked by a scrutineer.

7 Scoring

In the following tables, maximum points per discipline are listed. For the detailed calculation, refer to the concerning chapters.

DriverMore	Points
Engineering Design Event	300
Cost and Manufacturing Event	150
Business Plan Presentation	150
Autonomous Acceleration	50
Acceleration	25
Autonomous Skid Pad	50
Skid Pad	25
AutoX	100
Endurance	200
Efficiency	50
Total	1100

DriverLess	Points
Acceleration	75
Skid Pad	75
AutoX	100
Trackdrive	250
Efficiency	100
Total	600

DriverOld	Points
Acceleration	200
Skid Pad	200
AutoX	200
Endurance	400
Total	1000

7.1 Static Events Scoring

Engineering Design Event	
Overall Vehicle Concept and Innovation	30
Software	25
Vehicle Performance / Aerodynamics	40
Mechanical / Structural Engineering	25
Tractive System / Powertrain	40
LV-Electrics / Electronics / Hardware	25
Autonomous Functionality	65
Driver Interface	25
Engineering Design Report	25
Total	300

Cost and Manufacturing Event	
Format and Accuracy of Documents	10
Knowledge of Documents and Vehicle	10
BOM and BOM discussion	50
Discussion Part 2 “Cost Understanding”	50
Part 3 “Real Case”	30
Total	150

Business Plan Presentation	
Preparation	15
Pitch Video	15
Content	30
Finances	15
Demonstration and Structures	20
Delivery	15
Questions	15
General Impression	25
Total	150

7.2 Static Events Penalties

If a team does not show up for a judging session for any static event, there will be a penalty of 50 points. It is possible to deregister from a static event or change slots until 24 h before the VDE E-Race on-site registration starts.

Any change request needs to be communicated to statics@erace-v.de.

7.3 Dynamic Events Scoring

The following chapter describes how the scores for the Dynamic Events are calculated.

Discipline	Scoring Formula
Manual Acceleration [DM][DOLD]	$AccelerationScoreManual[DM] = 0.95 \cdot P_{max} \cdot \left(\frac{\frac{T_{max}}{T_{team}} - 1}{0.5} \right) c$ <p>T_{max} is 1.5 times the time of the fastest vehicle including penalties.</p> <p>P_{max} are the max. points awarded for this discipline according to Scoring.</p>
Autonomous Acceleration [DM]	$AccelerationScoreAutonomous[DM] = P_{max} \cdot \frac{N_{all} + 1 - R_{DV,team}}{N_{all}}$ <p>$R_{DV,team}$ is the ranking of team's best driverless time including penalties within the best driverless times including penalties of all other teams.</p> <p>N_{all} is the number of teams who finished at least one manual or driverless run without DNF or DQ.</p> <p>P_{max} are the max. points awarded for this discipline according to Scoring.</p>
Acceleration [DV]	$AccelerationScore[DV] = 0.95 \cdot P_{max} \cdot \left(\frac{T_{max}}{T_{team}} - 1 \right) + 0.05 \cdot P_{max}$ <p>T_{max} is 2 times the time of the fastest vehicle including penalties.</p> <p>P_{max} are the max. points awarded for this discipline according to Scoring.</p>
Manual Skid Pad [DM][DOLD]	$SkidPadScoreManual[DM] = 0.95 \cdot P_{max} \cdot \left(\frac{\frac{T_{max}}{T_{team}} - 1}{0.25} \right) + 0.05 \cdot P_{max}$ <p>T_{max} is 1.25 times the time of the fastest vehicle including penalties.</p> <p>P_{max} are the max. points awarded for this discipline according to Scoring.</p>
Autonomous Skid Pad [DM]	$SkidPadScoreAutonomous[DM] = P_{max} \cdot \frac{N_{all} + 1 - R_{DV,team}}{N_{all}}$ <p>$R_{DV,team}$ is the ranking of team's best driverless time including penalties within the best driverless times including penalties of all other teams.</p> <p>N_{all} is the number of teams who finished at least one manual or driverless run without DNF or DQ.</p> <p>P_{max} are the max. points awarded for this discipline according to Scoring.</p>

Discipline	Scoring Formula
Skid Pad [DV]	$SkidPadScore[DV] = 0.95 \cdot P_{max} \cdot \left(\frac{\left(\frac{T_{max}}{T_{team}} \right)^2 - 1}{1.25} \right) + 0.05 \cdot P_{max}$ <p> T_{max} is 1.5 times the time of the fastest vehicle including penalties. P_{max} are the max. points awarded for this discipline according to Scoring. </p>
AutoX [DM][DOld]	$AutoXScore[DM] = 0.95 \cdot P_{max} \cdot \left(\frac{\frac{T_{max}}{T_{team}} - 1}{0.5} \right) + 0.05 \cdot P_{max}$ <p> T_{max} is 1.25 times the time of the fastest vehicle including penalties. P_{max} are the max. points awarded for this discipline according to Scoring. </p>
AutoX [DV]	$AutoXScore[DV] = 0.9 \cdot P_{max} \cdot \left(\frac{T_{max} - T_{team,total}}{T_{max} - T_{min}} \right) + 0.1 \cdot P_{max}$ $T_{team,total} = \min(T_{team,1}, \text{avg}(T_{team,1}, T_{team,2}))$ <p> $T_{team,1}$ is the team's time including penalties of run 1. $T_{team,2}$ is the team's time including penalties of run 2. T_{max} is the time for driving the lap with $6 \frac{m}{s}$. T_{min} is the time of the fastest $T_{team,total}$ of all teams. For runs that are DNF or DQ and for runs with a $T_{team,i}$ above T_{max}, $T_{team,i}$ is set to T_{max}. P_{max} are the max. points awarded for this discipline according to Scoring. </p>
Endurance[DM][DOld]	$Endurance[DM] = 0.9 \cdot P_{max} \cdot \left(\frac{\frac{T_{max}}{T_{team}} - 1}{0.333} \right) + 0.1 \cdot P_{max}$ <p> T_{max} is 1.333 times the time of the fastest vehicle including penalties. P_{max} are the max. points awarded for this discipline according to Scoring. </p>
Trackdrive [DV]	$TrackdriveScore[DV] = 0.75 \cdot P_{max} \cdot \left(\frac{T_{max}}{T_{team}} - 1 \right) + 0.25 \cdot P_{max}$ <p> T_{max} is 2 times the time of the fastest vehicle including penalties. Additional 10 points are awarded per complete Lap (10 laps in total) P_{max} are the max. points awarded for this discipline according to Scoring. </p>

Discipline	Scoring Formula
Efficiency [DM]	$EfficiencyScore = P_{max} \cdot \left(\frac{EF_{max} - EF_{team}}{EF_{max} - EF_{min}} \right)$ $EF = T^2 \cdot E$ $E[CV] = V_{fuel} \cdot 3.55 \frac{kWh}{l}$ <p>EF_{team} is the team's efficiency factor.</p> <p>EF_{min} is the lowest efficiency factor of all teams which were considered for efficiency.</p> <p>EF_{max} is defined as 1.5-time EF_{min}</p> <p>T is the uncorrected elapsed driving time.</p> <p>E is the used energy in kWh.</p> <p>V_{fuel} is the team's corrected used fuel volume.</p> <p>P_{max} are the max. points awarded for this discipline according to Scoring.</p>

7.4 Dynamic Events Penalties

After a discipline, various aspects of the technical regulations may be checked again. Deviations will result in penalty points. The penalty points will be calculated according to Formula Student rules (see Formula Student Rules IN12).

Penalty points for driving errors or wrong/late queuing (only Endurance) are also assessed according to Formula Student rules (see Formula Student Rules D9).

7.5 General Penalties

Every violation of the rules during the competition may lead to a penalty for the team. The amount and nature of the penalty shall be determined by the officials.

7.6 Publishing Results

The results will be published on the event website and on the wall of champions. Check our social media accounts to be always up to date.

7.7 Protesting

To protest a rule, score, judge's decisions, time, or any other aspect of the competition, the team must present the issue to the event control for discussion, and possible resolution before the protest is led.

To lay a protest, fill in the "Pro-Protest" form and hand it in at the event control. Protests can only be handed in by the team captain or his/her deputy.

Protests must be led within one hour after the action being protested has occurred or the scores for the activity involving the protest's subject are posted.

The protesting team must post a 25 points bond to be deducted from their score if the protest is denied. The decision of the officials regarding any protest is final.