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ONLINE

COMPETITION PROCEDURE 2022

Unsportsmanlike conduct

Be respectful. Harassment and abuse are never tolerated. If you are in a situation that makes you uncomfortable at the event, if the event itself is creating an unsafe or inappropriate environment, or if interacting with an official or event organizer makes you uncomfortable, please report it to one of our board members.

Harassment includes but is not limited to offensive verbal or written comments related to gender, age, sexual orientation, disability, physical appearance, body size, race, religion, social class, economic status, veteran status, sexual images, deliberate intimidation, stalking, following, harassing photography or recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome sexual attention. If what you're doing is making someone feel uncomfortable, that counts as harassment and is enough reason to stop doing it.

Participants asked to stop any harassing behavior are expected to comply immediately.

If a participant engages in harassing behavior, FSONline may take any action it deems appropriate, including warning the offender or expulsion from the event with no eligibility for refund of any type.

Causing any intended harm in the simulators during the simulation events (Virtual DV Event and Dynamic Event) may result in the exclusion of the team from the event.

1. General Conduct

- 1.1. The official communication channel for any event related questions is hello@formulastudentonline.com.
- 1.2. Not showing up on the online events is considered as DNF. There is a 5 minute window after the deadline to cover the technical issues.
- 1.3. Any attempt to compromise the IT infrastructure (involving any tools related to the FS Online event, e.g. driverless simulator, or submission system) of the event will result in immediate disqualification.
- 1.4. If a participant engages in harassing behavior, FSONline may take any action it deems appropriate, including warning the offender or expulsion from the event with no eligibility for refund of any type.
- 1.5. Harassment includes but is not limited to offensive verbal or written comments related to gender, age, sexual orientation, disability, physical appearance, body size, race, religion, social class, economic status, veteran status, sexual images, deliberate intimidation, stalking, following, harassing photography or recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome sexual attention.

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2. Competition Overview

- 2.1. Formula Student Online 2022 is a virtual Formula Student competition open to CV, EV and DV teams.
- 2.2. Registration will be open separately to the three classes, with the following number of slots open in the competition itself:
 - Conventional category (CV and EV teams are all welcome) (CC): 12 slots
 - Driverless category (DC): 8 slots
- 2.3. Static and dynamic disciplines will be held for all classes, detailed in Sections 3&4.
- 2.4. A static event preparation period will be followed by live-streamed finals for both static and dynamic disciplines in a one-day live broadcast.
- 2.5. Competition timeline:
 - Registration date: 1st October
 - Challenge The Industry stage 1 (Submission deadline): 22nd October
 - Industrialize your design stage 1 (Submission deadline): 22nd October
 - Keep your team alive stage 1 (Submission deadline): 22nd October
 - DV Simulator testing week: approx. 2 weeks before finals day (exact date TBD)
 - CC Simulator livery submission deadline: 27th October
 - CC Simulator test: 20th October - 4th November
 - Live broadcast final with Static and Dynamic finals: 5th November

3. Static Events

3.1. Challenge The Industry

3.1.1. INTRODUCTION OF THE EVENT

- 3.1.1.1. Challenge the Industry (later quoted as CTI) is a new Static Event, introduced by Formula Student Online, to further improve the wide variety of challenges one is set to overcome in the world of Formula Student. This event is similar to the previously known Business Plan Presentation Event (later quoted as BPPE), but more adjusted to today's economical and technological standards. The aim of this event is to introduce the teams to real life challenges, problems and situations which need to be solved, all based on the industry and the future's challenges.
- 3.1.1.2. Within the CTI event teams are required to find a solution to a real-life problem, with the help of a business idea. Just as in the traditional BPPE, the judges are portrayed as investors, and the teams are required to sell a unique, but most importantly viable solution to a given problem.
- 3.1.1.3. To clarify, the main difference between CTI and BPPE is that with the BPPE teams can dream up any kind of business idea, no matter how viable they are, or if they are actually solving a real problem. The CTI on the other hand only takes into account business ideas, which could exist in the real world, and for which there would be a genuine need to exist.

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3.1.2. CTI IS CONSISTING OF TWO MAIN STAGES AS LISTED BELOW:

Stage 1:

- The One Pager
- Pitch Video

Stage 2:

- CTI Live Pitch

3.1.3. STAGE 1: THE ONE PAGER

3.1.3.1. The One Pager (later quoted as CTIOP) is the first part of the Stage 1 challenges, aimed to give the teams a chance to collect their idea and all its attributes in one place, and do it as effectively as possible. The CTIOP should consist the following elements:

- Team name
- University's full name
- Team's car number which they registered to the competition
- Team's category
- Comprehensive description of the solution and business case

3.1.3.2. The format of the CTIOP is the conventional A4 sized paper, meaning that the document's width is 210 mm, while its height is 297 mm.

3.1.3.3. Due to the online format of our competition, this paper is to be created and formatted as a PDF document.

3.1.3.4. We are not aiming to kill creativity, therefore you are eligible to use any font you like in any size, but please keep in mind that readability is a must with a document like this.

3.1.3.5. The deadline for submitting the CTIOP is 22nd October.

3.1.4. STAGE 1: PITCH VIDEO

3.1.4.1. The teams are also required to create a Pitch Video (later quoted as CTIPV) to showcase their knowledge regarding the topic, and elaborate on their solution and business case they introduce in the CTIOP.

3.1.4.2. The CTIPV's maximum allowed length is 90 seconds.

3.1.4.3. The CTIPV has no prefixed format, the creative solutions are welcome as always.

3.1.4.4. The CTIPV must be submitted in a PDF format after logging in with a team account. This PDF document should contain the following:

- Team name
- Car number
- Category
- A link to the CTIPV
 - YouTube hidden video
 - Vimeo

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3.1.5. STAGE 2: LIVE PITCH

- 3.1.5.1. In the second stage of CTI, teams are required to present their business idea in front of the judges, to which they would have 10 minutes. This is a real time presentation but held within the online space.
- 3.1.5.2. The maximum number of presenters is 3, and only they are allowed to be present during the live pitch.
- 3.1.5.3. Other technical details of the CTI's Live Pitch stage:
- Exemplary agenda of a CTI Live Pitch event, with 30 min slots
 - Team login and setup (5 min)
 - Presentation (10 min)
 - Questions and Answers (5 min)
 - Short feedback (5 min)
 - Buffer time (5 min)
 - The platform for the pitch presentation will be the Zoom.

3.2. Industrialize Your Design

3.2.1. INTRODUCTION OF THE EVENT

- 3.2.1.1. Formula Student provides a fantastic initiation into the vehicle industry's challenges by allowing students to participate in a project that takes them through the entire product design process. Designing a prototype racecar is a fantastically exciting project that brings out all the passion and enthusiasm of the participants. However much the original intention of Formula Student was to design a racecar that could be manufactured in small series, this idea might not be so prevalent in the construction of today's highly advanced and targeted competition cars. This discipline challenges you to place your design into a mass-production environment and rethink the process from design to production to ensure it is fit for a less specialized environment. Consideration of performance and cost tradeoffs thoroughly is expected, and maximum points will be awarded for the most exhaustive discussion of measures taken.
- 3.2.1.2. Industrialize your design (later quoted as IYD) combines Engineering Design Event and Cost & Manufacturing Event into a single task that can be more appropriately evaluated in an online setting. You will be required to apply your team's engineering theoretical knowledge as well as manufacturing and industrial cost analysis abilities to excel in this discipline.

3.2.2. IYD IS CONSISTING OF TWO MAIN STAGES AS LISTED BELOW:

Stage 1: Submission of White paper documentation
Stage 2: Pitch presentation of the chosen design

3.2.3. TASK

- 3.2.3.1. Choose a subsystem or part from your car that should potentially be redesigned for a series production of 25,000 vehicles a year (this does not necessarily mean that your production

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would have to be sized for 25,000 parts per year).

- 3.2.3.2. Introduce briefly the original design and baseline performance characteristics that are relevant to its role in ensuring the overall performance of the vehicle (i.e. in the case of a wing, its weight, position, C_l and C_d values). Judges must understand why the chosen part or subassembly is required for the proper functionality and performance of the overall vehicle. This naturally means that the overall vehicle performance must also be introduced briefly, with the focus staying on the chosen subassembly.
- 3.2.3.3. Describe how the product development cycle of this part would be changed for the production volume defined in 3.2.3.1. Elaborate on conceptualization, design, as well as testing, validation and quality assurance.
- 3.2.3.4. Introduce the manufacturing process that would ensure sufficient quality and quantity of the product, including but not limited to manufacturing environment and line, quality control processes, fitment to overall vehicle, etc.
- 3.2.3.5. Provide a cost plan for the chosen part or subassembly to support the documentation and prove that it could be a viable alternative to the original design from a business perspective in the larger manufacturing volume as well. The more detail you provide about the business environment (i.e. wages, associated costs, tooling and machine costs, etc.), the more understanding you will show to the judges.
- 3.2.3.6. Introduce performance trade-offs - or their avoidance with good design practices - that were necessary to ensure the part is fit for mass manufacturing.

3.2.4. DELIVERABLES

- 3.2.4.1. Stage 1 deliverable is a white paper, consisting of maximum 8 pages documentation A/4 size, including points 3.2.3.1 - 3.2.3.6. from Task Description. Figures are included in the 8 pages. Detailed cost breakdown documentation and technical drawings can be submitted as additional material, not included in the 8 page limit, without limitation.
- 3.2.4.2. In Stage 2, teams present their findings live during the broadcast event. Maximum length of the pitch presentation is 15 minutes.
 - In the presentation setting, the judges are board members in your company to whom you have to present the findings of your feasibility study.
 - Maximum two team members may present during the video presentation.
 - The video presentation must include all components of the Task from **3.2.3.1. - 3.2.3.6.**
 - The FSO Team will provide a schedule for the presentations during the livestreamed final day.
- 3.2.4.3. Other technical details of the IYD's Live Pitch stage:
 - Exemplary agenda of a IYD Live Pitch event, with 30 min slots
 - Team login and setup (5 min)
 - Presentation (10 min)
 - Questions and Answers (5 min)
 - Short feedback (5 min)
 - Buffer time (5 min)
 - The platform for the pitch presentation will be the Zoom.

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3.3. Keep Your Team Alive

3.3.1. INTRODUCTION OF THE EVENT

- 3.3.1.1. A team's sustainability not only comes up in its environmental impact, but also in its organizational structure, decision making methods, and risk analysis. We request the teams to start brainstorming, because growing the knowledge in these groundbreaking fields will help in decision making during the development process of its race car, as well as in the team member's professional life.
- 3.3.1.2. To clarify, the Keep Your Team Alive (later quoted as KYTA) is a new idea and judges want to know the team's decision-making process and the way of its complex thinking. So, as a team, for absolving this task, the knowledge gained from participating in all three FS static events and solving the daily tasks.
- 3.3.1.3. From the given three different so-called real-case scenarios (3.3.2.), teams need to choose one specific case and create a detailed solution for managing the crisis. Team members will be engineers, economists, so be creative, collect and connect all the impacts in relation to the chosen case that affect the team's success and effectiveness in the seasons. We request that the teams' solutions cover the topic of:
- Sponsorship
 - Knowledge transfer
 - Component reuse
 - Team management
 - Development
- Besides these, all novel insights are welcome.

3.3.2. THESE ARE THE OPTIONAL SCENARIOS, TEAMS NEED TO CHOOSE ONLY ONE.

- 3.3.2.1. Imagine a situation where you have to face a *20.000 EUR* decrease in your sponsorational budget. How would you stabilize financially?
- 3.3.2.2. Imagine a situation where you have to face a big generational change, more than half of your core team change to an alumni status, how would you reconcile the recruiting program with the development phase?
- 3.3.2.3. Imagine a situation where you have to face a big pressure from your stakeholders to change to hybrid / electric powertrain / driverless. How would you manage the reorganization of the team, knowledgebase and resource management?

3.3.3. KYTA IS CONSISTING OF TWO MAIN STAGES AS LISTED BELOW:

Stage 1:

- The Mind Map
- Two-pager introduction

Stage 2:

- Live Pitch

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3.3.4. STAGE 1: THE MIND MAP

- 3.3.4.1. The Mind Map is the first part of the Stage 1 challenges, aimed to give the teams a chance to collect their idea and all its attributes in one place, and do it as effectively as possible. The Mind Map should consist the following elements:
- Team name
 - University's full name
 - Team's car number which they registered to the competition
 - Team's category
 - The chosen topic for the event (A/B/C)
- 3.3.4.2. The focus of the mind map is on the success of the project , goals of the season
- 3.3.4.3. The format of this Mind Map is maximum the conventional A1 size paper, meaning that the document's maximum size is 594x841 mm.
- 3.3.4.4. Due to the online format of our competition, this paper is to be created and formatted as a PDF document.
- 3.3.4.5. We are not aiming to kill creativity, therefore you are eligible to use any font you like in any size and different colors, pictures, icons etc.. Please keep in mind that readability is a must with a document like this.
- 3.3.4.6. The deadline for submitting the Mind Map is 22nd October.
- 3.3.4.7. The scoring and evaluation aspects of the Mind Map includes the following criterias:
- Decision-making processes
 - Resource management
 - Time planning
 - Budget planning
 - Human resources, recruitment
 - Risk analysis methods
 - Technical side of the projects
 - Design process
 - Component reuse
 - Manufacturing process
 - Test and validation

3.3.5. STAGE 1: TWO-PAGER

- 3.3.5.1. The teams are also required to create a two page long introduction for the created mind map. Teams also have the chance to submit a detailed timeplan, budget plan, recruitment plan etc. in a table format as additional material, not included in the 2 page limit, without limitation.
- 3.3.5.2. The Two-Pager must be submitted after logging in with a team account. This PDF document should contain the following:
- Team name
 - Team's car number which they registered to the competition
 - Team's category
 - The chosen topic for the event (A/B/C)

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- 3.3.5.3. The format of this document is two pages of the conventional A4 size paper, meaning that the document's size is 210x297 mm.
- 3.3.5.4. Due to the online format of our competition, this paper is to be created and formatted as a PDF document.
- 3.3.5.5. The deadline for submitting the Two-pager Introduction is 22nd October.
- 3.3.5.6. The scoring and evaluation aspects of the Two-Pager includes the following criterias:
- Mind Map interpretability
 - Clear extract of the solution method

3.3.6. STAGE 2: LIVE PITCH

- 3.3.6.1. In the second stage, teams are required to present their solutions, decisions due to the chosen scenario in front of the judges, to which they would have 10 minutes. This is a real time presentation but held within the online space.
- 3.3.6.2. The maximum number of presenters is 3, and only they are allowed to be present during the live pitch.
- 3.3.6.3. Other technical details of the KYTA Live Pitch stage:
- Exemplary agenda of a KYTA Live Pitch event, with 30 min slots
 - Team login and setup (5 min)
 - Presentation (10 min)
 - Questions and Answers (5 min)
 - Short feedback (5 min)
 - Buffer time (5 min)
 - The platform for the pitch presentation will be the Zoom.

4. Dynamic Events

4.1. INTRODUCTION OF THE EVENT

Dynamic events will be held in dedicated virtual simulators for CC and DV categories. As in on-site competitions, events for CC classes will be more similar while DV will use a different platform and format altogether, as discussed below.

4.2. CC category:

- 4.2.1. Dynamic events will use a commercially available simulator software with modifications specifically developed for FS Online 2022, i.e. mods from previous years will not be compatible with this year's competition.
- 4.2.2. Four event types will be offered: fun events, Time Attack, Autocross and FSO Super Special.
- 4.2.3. Time Attack will determine the starting order of Autocross and driver pairings for FSO Super

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Special and will be a timed event where the aim is to reach the single fastest lap time.

- 4.2.4. Autocross event will be livestreamed where one driver will get one chance to perform the best lap time.
- 4.2.5. FSO Super Special will take place on a Race of Champions-style racetrack with two drivers competing side-by-side on alternate routes. Best drivers will advance through a knockout ladder to the top, to be the ultimate simulator champions of FSO 2022!

4.3. DV category:

- 4.3.1. A detailed competition procedure for DV events will follow in the coming weeks.

5. Registration Procedure

- 5.1. Registration to Formula Student Online 2022 will take the form of a quiz with engineering- and Formula Student related questions (5-10 questions).
- 5.2. The registration will take place on the 1st of October, 12:00 noon CEST.
- 5.3. Questions in the registration quiz will be based upon the latest version of the Formula Student Rules.
- 5.4. Registration platform will be Socrative, where a single quiz will be opened by all teams.
- Link to the quiz will be available on formulastudentonline.com
 - As soon as free slots are filled, successfully registered teams will be notified in an e-mail, including payment details.
 - Payment must be completed within 72 hours from receiving the e-mail (credit card payment will be available).
 - Registration to FS Online 2022 will only be completed once the registration fee is credited to the account of FS Online.
 - If a team fails to complete the payment in time, they will be disqualified from the competition, and the first team from the waiting list will be notified and required to pay within 72 hours from notification.
 - Registration quiz will be open for 2 hours on the 1st of October.
 - A list of registered and waitlisted teams will be available on our website soon after the registration closes.
- 5.5. Teams with more than one registration under their name will be disregarded with all accounts from the registration!
- 5.6. Timestamps of registration answers will be recorded. Teams with the most correct answers will advance to the official registration list. In case of point equality, the team with the quicker time will be ranked higher.

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- 5.7. Teams move from the registration list to the participant list once their registration fee has been credited to the account of the organizing body.
- 5.8. Registration fee for the event is 250 EUR +VAT.

6. Additional Information

- 6.1. The final competition day with broadcast live finals will take place on 5th of November, 2022.
- 6.2. Official broadcast channel will be the FS Online YouTube channel.

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