

## **Scope of Design Experience: (150 points)**

Given the unique challenges that COVID-19 is imposing on both industry and academia, this year's Design Experience will try to capture the essence of the in-person judging experience while playing to the strengths of the virtual component. The goal is to provide the best possible educational experience for students, using virtual tools, by mimicking an executive level engineering design review representative of an industry experience.

The format is intended to simulate a design department presenting to the CEO and leadership team of their Engineering firm, looking for a design update on their vehicle about to be launched into the marketplace. The company was competing multiple design efforts in parallel and will be evaluating the competing designs and engineering departments to determine the best collective effort.

The one-hour judging experience will consist of:

- A student-lead design review
- A judge-lead break out session.

Teams will use a standard format (template) for the design review which provides an overview of the car, either as-built or as-designed, as well as an opportunity for the students to address the scoring requirements.

The goal for the first 15 minutes is for the students to cover the vehicle design efficiently and effectively in as much detail as possible while balancing their time across the different scoring areas. Teams will submit PPT slides ahead of time, in lieu of the traditional design report. Judges will review and become familiar with content. The student team does not need to cover all slides, just highlight particular content they think is worthy of highlighting to the judges.

The goal for the last 40 minutes will be a break out session where the different "department heads" (judges) will ask follow up questions to individual team members about their relative areas of experience and deep dive the student's technical knowledge and its application to the product offering.

*Remember: The purpose of Formula SAE is not to identify the best race car. The purpose is to build educational learning experiences for talented students. The car design and build (where relevant) reflect the skills of the students but are on aspect of the judging.*

## **Student Deliverables:**

Student competitors must submit a Design Review Briefing (DRB) and Design Spec Sheet (DSS) prior to the competition. The Design Review Briefing and Design Spec Sheet provide judges with a 'sneak peek' at the designs. Teams that do not submit all documents will be disqualified from the Design event and receive zero points.

As per the official FSAE rules, the DRB must utilize the PowerPoint template (to be published on fsaonline.com at a time closer to the competition).

The template will have details about content and how many slides may be used to cover each topic. The DRB will not be judged based on length. Content of the DRB should highlight design goals, processes, and details in engineering terms. The intended audience is that of experienced engineers and while concise, the content should be technical and cover all major vehicle systems highlighting notable features.

The DRB will be reviewed ahead of time by the design judges, and the student team may choose to present a portion of the content during their allocated time during the virtual judging.

The DSS is based on a fixed template located on the official FSAE website and contains detailed system and component level specifications in Excel file format.

## **The Design Review Presentation:**

The traditional FSAE in-person Design Presentation remains an essential part of the competition.

Each time slot will be exactly one hour long with approximately 45 minutes for the judges to review the vehicle with the team members and the remaining time used by the judges to write notes and score the car. At the conclusion of First Round Design Judging, approximately 8-12 cars will be selected to advance to Design Finals.

Design judging will consist of approximately 15 groups (queues) of judges, each having six to eight design judges. This means 15 cars are being judged simultaneously. The judges in each queue will evaluate the following areas:

- Suspension
- Frame / Body / Aero
- Powertrain
- Cockpit / Controls / Brakes / Safety
- Systems Management / Integration
- Manufacturability / Serviceability
- Aesthetics / Style & Creativity

Teams should make a point of reviewing the Design Judging Score Sheet on the official FSAE website. The score sheet gives the competitors insight into how they will be judged, as well as giving them a detailed breakdown of each judging category. Each judge has a different area of niche expertise and will seek out the student team member responsible for that particular area of

the car. There may also be judges who will be briefly assessing cars across judging groups while also making note of particularly interesting vehicle features and/or flaws.

Expanded definitions of each area have been provided on the Design Score Sheet, along with space for comments. Since the score sheet is used as a tool by the judges, the values written on the form will likely not add up to the team's Official Score. The judges are strongly encouraged to make lots of notes and provide written feedback to the student competitors.

During first round judging, each student team should have at least one representative who is prepared to discuss each major system individually. This means five or more students should be prepared to speak independently. This will be handled through breakout sessions within the virtual judging platform. If the judges must split their time between a single student (i.e. if one team member holds ALL the answers), lower scores could result based on total amount of information received. Students should have all information they feel is relevant (charts, graphs, parts, photos, video, etc.) available and ready to support their design efforts. Data, data, data. Ideally, much of the needed content would be part of the main Design Review presentation, but other content can be shared via screen sharing. A high emphasis is placed on the student team's ability to Design, Build, Refine & Validate, and Understand their vehicle.

At the conclusion of First Round Design Judging, each queue will pick approximately one car to send on to Design Finals. Design Finals will take place at a later date that will be announced closer to the competition.

Design Finals will be run similarly to earlier rounds where the judges will review the Design Review ahead of time but will immediately split into breakout sessions where each small judging team will ask their specific questions to the student participants. The questions will be provided in advanced at the discretion of event captains so the teams may split themselves into the appropriate breakout topics to maximize their team's participants to the questions subject matter.

The overall Design Event Winner will be announced after the design judges have met to review the results.

Judging feedback will be compiled and sent to the teams after their last round of judging (either preliminary or final)

## **The Design Presentation Recap:**

All teams will be assigned a time on the specified date, to be supplied closer to the event.

Teams will be assigned a 60-minute time slot which breaks down as follows:

- 5 minutes for logging on and greetings
- 15 minutes for team presentation segment highlighting elements of their knowledge
- 40-minute judges' question and answer in discipline-specific breakout sessions
- Teams will present select slides from their Design Review briefing
- They will then split up into breakout sessions with the appropriate subject matter experts for each category on the score sheet

- Teams are encouraged to have all engineering related material to their vehicle design and presentation readily available on their computer to share on-screen with judges.
- Judges will provide feedback on presentation and written report at this time.

### **Submission Requirements:**

Design Review Briefing (DRB) using PowerPoint Template submitted as ppt file format **\*Now submitting as PDF.**

**Three View Drawings submission has been added. Submitting as PDF.**

Design Spec Sheet (DSS) using Excel Template submitted as.xlsx file format.

### **Submission Deadlines:**

Documents will be due on March 1, 2021 before 11:59 PM EDT

### **Design Round 1 Judging Date:**

Teams will be assigned a specific time to present during April 20 – 23, 2021. A team's static schedule will be supplied later.

### **Design Finals Judging Date:**

Design Finals will take place at a later date that will be announced closer to the competition.