

# 2021 CDS COMPETITION PLANS

September 1, 2020  
Revised March 3, 2021





## 2021 COMPETITION PLAN

Dear Collegiate Design Series Teams,

As the world embraces the new reality of the COVID-19 into 2021, SAE International wants to ensure you that we are moving forward with plans to allow continued student engagement in a controlled manner to meet all the necessary precautions of the pandemic and still deliver on strong educational experiences for your teams in 2021.

We know that planning for a typical competition year is not an option based on the following:

- Academia landscape is reporting over 50% universities resuming the fall semester operating either 100% virtual or with some sort of hybrid model. Spring semesters are either reported as going virtual or TBD.
- 85% of our teams reported seeing their project funding either secured and now in jeopardy or not being secured.
- 71 % of the teams have restrictions on budget and lab space set by the university.
- 45% of our teams may be unable to participate onsite in the spring/summer due to being located outside of the United States border.
- 28% of teams already are aware of a travel ban policy implemented at their university effective until end of Spring 2021 semester.
- Many sponsors and volunteers' employers still have a travel restriction ban in place.
- Local and State guidelines on operating large group gatherings vary in sizes across the country and within the state itself. Currently the largest reported flat number is 250; some venues offer a percentage such as 25% of max capacity or whatever is the smallest number.

Then we must consider items like having to social distance, requiring personal protection equipment, creating plans for contact tracing, temperature checks and COVID-19 safety protocols for onsite operations.

SAE will be updating this document once new information becomes available. In addition to this document, SAE may publish separate files for Validation Events.

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## Team Action Required

To ensure your team is eligible to participate in the 2021 Collegiate Design Series Knowledge Events, your team must **STOP, READ, and TAKE ACTION!**

Competing in a virtual environment is not unlike being onsite; there are many moving parts. SAE International would like to remind teams that you need to be diligent in watching communication received (or not received) and contact us for assistance.

As we have navigated our first few Knowledge Events, we want to remind teams of the following actions you need to take:

1. Team members are responsible for reading and watching for updates to the 2021 competition documentation including but not limited to, the 2021 Rules set, 2021 Event Descriptions and the 2021 CDS Competition Plan.
2. Team Captains make sure you are affiliated to your teams Fast-Track Roster on [www.sae.org](http://www.sae.org).
3. Team Captains (or delegated team member) make sure your team is submitting all required documents. SAE is sending out courtesy warning emails however these are not required on our part. If a document submission is missed, your team will be removed from competing from Knowledge and/or Validation Events. You must participate in all aspects to stay eligible.
4. Warning emails on late submissions or cancellation notices will come from your competition series website, i.e., [website@fsaeonline.com](mailto:website@fsaeonline.com) or [website@bajasae.net](mailto:website@bajasae.net).
5. Team Captains need to make sure you are receiving emails from Qualtrics via SAE International to provide names and emails of presenters for events. Team Captains will receive this email survey for every event to complete.
6. SAE International will send email invites to every team member provided from Pathable.com (third party vendor used for Knowledge Event). This email will come from 2021 CDS Knowledge Events ([no-reply@pathable.com](mailto:no-reply@pathable.com)).
7. All team members are responsible for ensuring this email is received and they follow steps to claim their profile online Pathable.com. SAE will post updates on newsfeed and push out notifications via the competition series App (Aero, Baja and FSAE); if you are a team member seeing this and you have not received an email then you need to contact [collegiatecompetitions@sae.org](mailto:collegiatecompetitions@sae.org) for assistance.
8. All team members are responsible for ensuring their scheduled time appointment is on their own calendars. A physical appointment will not be sent via email. \*Reminder to Teams: Verify the time on Pathable.com matches what has been published in Schedule Matrix for the specific event.
9. All team members are responsible for ensuring they can log in and access Zoom call during practice sessions which will be scheduled for student teams prior to day of judging.
10. All team members are responsible for contacting SAE International if having any issues. We do not know if you are having issues unless you tell us. Email [collegiatecompetitions@sae.org](mailto:collegiatecompetitions@sae.org) for any assistance in advance of the event.

11. On day of judging, if you can log in but having issues you are encouraged to visit the Helpdesk which is managed by Pathable.com and SAE Staff.

Just as in previous years if a team fails to submit documents, your team will be removed from competing any further.

If your team fails to attend the assigned time slot for your presentation, your team will be removed from competing any further.

By not completing any of the steps listed above and/or not contacting SAE International for assistance, your team will be considered withdrawn and removed from the registered teams list.

# SAE Aero Design

## Event Structure/Registration

SAE International will operate the 2021 competition season using a Hybrid Model offering student engagement in a 2-Step Registration Process.

### **Step 1 – SAE Aero Design Knowledge Event**

Registration will open for this ALL-virtual event the week of October 12. It is a requirement to take part in this virtual SAE Aero Design Knowledge event to register for the SAE Aero Design Validation Event that will be held in person. This event will include the following:

- Written Design Paper, 2D Drawing, Additional Tech Data Sheet – March 1, 2021
- Oral Design Presentation – Friday, March 26, 2021 and Friday, April 2, 2021

Limit on number of presenters may be enforced; please watch for news feed announcements and emails.

Educational online workshop – Winter Workshop hosted on January 22 – 23, 2021. Not a mandatory requirement.

### **Step 2 - SAE Aero Design Validation Event**

Registration for this event will open the week of November 18th. It is a requirement to take part in the SAE Aero Design Knowledge Event to register for this event. This event will include the following:

- Technical Inspection: Proof of Flight Video and Inspection PPT – May 28, 2021
- Flight Rounds – June 4 – 6, 2021 at Florida Air Museum in Lakeland, FL

Operating the 2021 competition season using the hybrid model will allow for any international team to participate in the competition by participating in the SAE Aero Design Knowledge Event if travel bans and closed borders remain an issue.

Due to the COVID-19 pandemic the actual execution of the event is subject to change. This document will be updated once new information becomes available. Teams can expect a scaled-down event in 2021.

Teams will consist of up to five (5) team members plus one (1) faculty advisor. This limit may be increased at a later time.

Events will be closed to spectators.

## Registration Fee Structure

Knowledge Event fee – student teams who register during the week of October 12<sup>th</sup> will be required to make payment of \$700.00 within 48 hours of confirming registration online. Registration fees are non-refundable.

Validation Event fee – student teams who register during the week of November 18<sup>th</sup> will be required to make final confirmation and payment of \$400.00 prior to 60 Days Out from

Validation Event date. **Payment and Registration Confirmation due April 5, 2021.**  
Registration fees are non-refundable.

*\*If the competition is cancelled due to COVID-19, SAE cannot guarantee a refund as we begin to make onsite preparations for university teams.*

### Event Results

SAE will score **Knowledge Event** components for the written design paper and verbal design presentation for all classes. Teams registered will be sorted into two categories: Concept Only (CO) vs Concept Manufacturing Design (CMD).

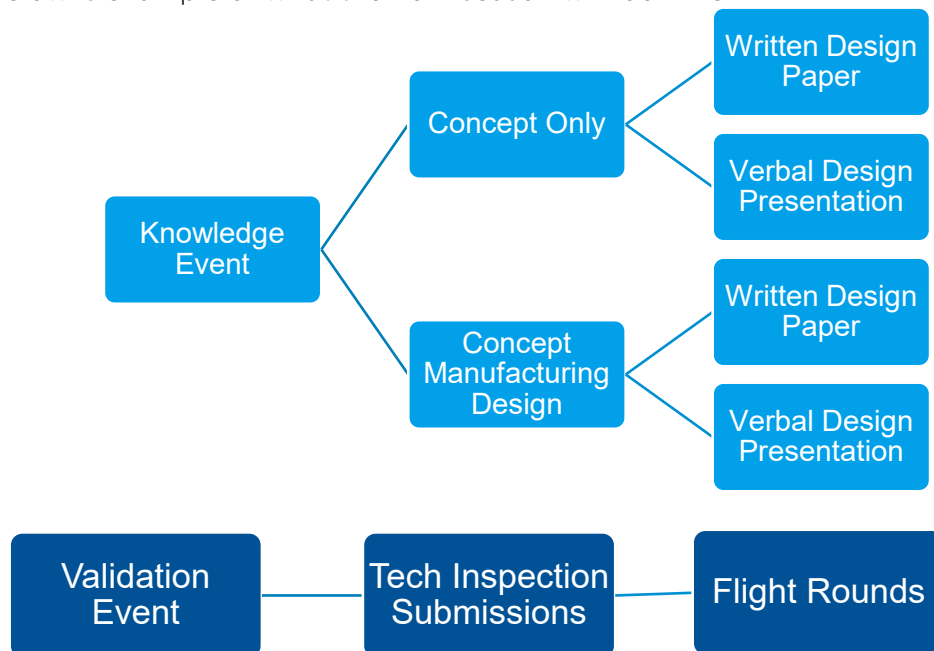
### Definitions:

Concept Only (CO) – teams registered for Knowledge Only Event.

Concept Manufacturing Design (CMD) – teams registered for Knowledge and Validation Event.

SAE will score **Validation Event** flight rounds for all classes. SAE will be hosting one Validation Event in Lakeland, Florida on June 4-6, 2021.

Below is example of what the 2021 season will look like:



SAE cannot stress enough the point that this year, the competition season will need to be flexible in planning to ensure the best experience possible. We may need to make changes as we get closer to onsite dynamic events. We will do our best to keep teams informed and prepared. **Teams are responsible for monitoring emails, news post and Aero Design App notifications.** We appreciate your patience during this time.

**Key Dates for Teams to know:**

**Knowledge Event:**

March 1, 2021 – Design Report, 2D Drawing, Additional Tech Data Sheet Due

March 26, 2021 – Knowledge Event Judging for Verbal Design Presentation

April 2, 2021 – Continued Knowledge Event Judging for Verbal Design Presentation

TBD – Virtual Awards Ceremony

**Validation Event:**

April 5, 2021 – Registration Confirmation and Payment Due

May 28, 2021 – Technical Inspection PPT and Proof of Flight Video Due

June 4-6, 2021 – Validation Event @ Florida Air Museum in Lakeland, Florida

June 6, 2021 – Award Ceremony

On behalf of the Organizing Committee, we thank you for your continued participation and patience as we navigate through this continued pandemic.

# Baja SAE

## Event Structure/Registration

SAE International will operate the 2021 competition season using a Hybrid Model offering student engagement in a 2-Step Registration Process.

### **Step 1 – Baja SAE Knowledge Event**

Registration will open for this ALL-virtual event the week of October 12. It is a requirement to take part in this virtual Baja SAE Knowledge Event to register for the Baja SAE Validation Event that will be held in person. This event will include the following:

- Notice of Intent for 4WD/AWD – February 15, 2021
- Written Cost Reduction Report – February 15, 2021
- Business Plan – February 19, 2021
- Online Cost Prototype – March 29, 2021
- Design Review Briefing – March 31, 2021
- Knowledge Design Judging – April 12 – 15, 2021
- Knowledge Cost Judging – Week of April 19, 2021
- Knowledge Business Judging – March 18 – 19, 2021

Limit on number of presenters may be enforced; please watch for news feed announcements and emails.

Educational online workshop – Winter Workshop hosted on January 22 – 23, 2021. Not a mandatory requirement.

### **Step 2 – Baja SAE Validation Event**

Registration for this event will open the week of November 18th. It is a requirement to take part in the Baja SAE Knowledge Event to register for this event. This event will include the following:

- Roll Cage Documentation Package – January 28, 2021
- Baja SAE Arizona – April 29 – May 2, 2021 @ MC Motorsports Park in Tucson, Arizona
- Baja SAE Louisville – May 20 – 23, 2021 @ Drop Forge Proving Grounds in Louisville, Kentucky

Operating the 2021 competition season using the hybrid model will allow for any international team to participate in the competition by participating in the Baja SAE Knowledge Event if travel bans and closed borders remain an issue.

Due to the COVID-19 pandemic the actual execution of the event is subject to change. This document will be updated once new information becomes available. Teams can expect a scaled-down event in 2021.

Teams will consist of up to eight (8) team members plus one (1) faculty advisor. This limit may be increased at a later time.



Events will be closed to spectators.

#### Registration Fee Structure

Knowledge Event fee – student teams who register during the week of October 12<sup>th</sup> will be required to make payment of \$900.00 within 48 hours of confirming registration online.

Registration fees are non-refundable.

Validation Event fee – student teams who register during the week of November 18<sup>th</sup> will be required to make final confirmation and payment of \$450.00 prior to 60 Days Out from Validation Event date.

Baja SAE Arizona Payment and Registration Confirmation due February 26, 2021.

Baja SAE Louisville Payment and Registration Confirmation due March 19, 2021.

Registration fees are non-refundable.

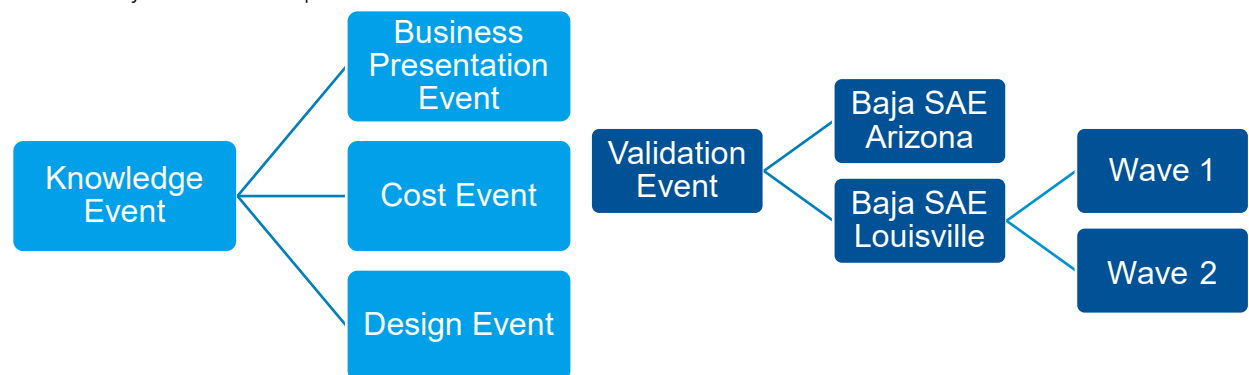
*\*If the competition is cancelled due to COVID-19, SAE cannot guarantee a refund as we begin to make onsite preparations for university teams.*

#### Event Results

At this time, it is SAE International's plan to score the virtual static events hosted during the Knowledge Event as a separate competition resulting in recognition of award winners for both individual events as well as overall accumulative score.

At this time, it is SAE International's plan to score the on-site dynamic events hosted during the Validation Events as a separate competition resulting in recognition of award winners for both individual events as well as overall accumulative score. \*Pending local/state guidelines based on CDC guidelines, the on-site events could see an operation change meaning we could be operating either one large event or several "waves" consisting of smaller number of teams onsite every 2-3 days. SAE will make every effort to keep this process as fluid as possible to best prepare teams, volunteers, and staff.

Below is just an example of what the 2021 season could look like:



SAE cannot stress enough the point that this year, the competition season will need to be flexible in planning to ensure the best experience possible. We may need to make changes as we get closer to onsite dynamic events. We will do our best to keep teams informed and prepared. **Teams are responsible for monitoring emails, news post and Baja SAE App**

notifications. We appreciate your patience during this time.

**Key Dates for Teams to know:**

**Knowledge Event:**

February 15, 2021 – Notice of Intent for 4WD/AWD Due  
February 15, 2021 – Written Cost Reduction Report Due  
February 19, 2021 – Business Plan Due  
March 18 – 19, 2021 – Knowledge Event Judging for Business Presentation  
March 29, 2021 – Online Cost Prototype Due  
March 31, 2021 – Design Review Briefing Due  
April 12 – 15, 2021 – Knowledge Event Judging for Verbal Design Presentation  
Week of April 19 – Knowledge Event Cost Audits Only  
TBD – Virtual Awards Ceremony

**Baja SAE Arizona Validation Event:**

January 28, 2021 – Roll Cage Documentation Package Due  
February 26, 2021 – Registration Confirmation and Payment Due for Baja SAE Arizona  
March 15, 2021 – 45 Days from competition – Onsite Logistics Plan Published  
March 30, 2021 – 30 Days from competition – Official Go/No-Go Announcement Made  
April 29 – May 2, 2021 – Validation Event @ MC Motorsports Park in Tucson, Arizona  
May 2, 2021 – Award Ceremony

**Baja SAE Louisville Validation Event:**

January 28, 2021 – Roll Cage Documentation Package Due  
March 19, 2021 – Registration Confirmation and Payment Due for Baja SAE Louisville  
April 6, 2021 – 45 Days from competition – Onsite Logistics Plan Published  
April 20, 2021 – 30 Days from competition – Official Go/No-Go Announcement Made  
May 20 – 23, 2021 – Validation Event @ Drop Forge Proving Grounds in Louisville, Kentucky  
May 23, 2021 – Award Ceremony

On behalf of the Organizing Committee, we thank you for your continued participation and patience as we navigate through this continued pandemic.

# SAE Clean Snowmobile Challenge

## Event Structure/Registration

SAE International will operate the 2021 competition as 100% virtual.

## SAE Clean Snowmobile Challenge Knowledge Event

Registration will open for this ALL-virtual event the week of October 12.

This event will include the following:

- Written Design Paper – March 15, 2021
- Oral Design Presentation – March 25, 2021
- Virtual Dynamic Event 1D Modelling Submissions – March 15, 2021
- Virtual Dynamic Event 1D Modelling Judging – March 26, 2021

Limit on number of presenters may be enforced; please watch for news feed announcements and emails.

Educational online workshop – Winter Workshop hosted on January 22 – 23, 2021. Not a mandatory requirement.

## Registration Fee Structure

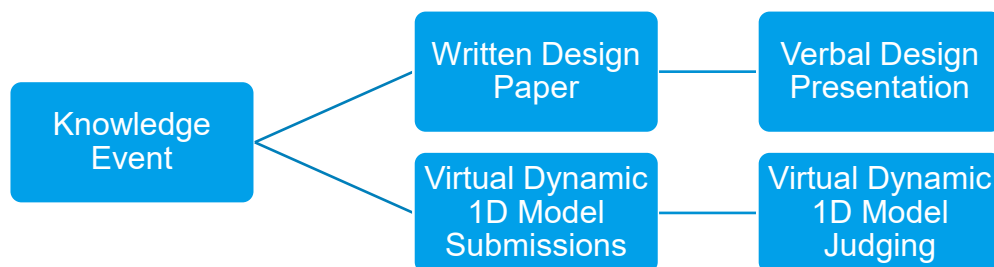
Knowledge Event fee – student teams who register during the week of October 12<sup>th</sup> will be required to make payment of \$650.00 within 48 hours of confirming registration online. Registration fees are non-refundable.

Operating the 2021 competition season using the virtual model will allow for any international team to participate in the competition by participating in the SAE Clean Snowmobile Knowledge Event if travel bans and closed borders remain an issue.

## Event Results

At this time, it is SAE International's plan to score the virtual static and dynamic events hosted during the Knowledge Event as separate events resulting in recognition of award winners for both individual events as well as overall accumulative score.

Currently, SAE International's plan to score the dynamic events through use of modelling components where each selected dynamic event will have its own set of models and defense used for evaluation and discussion.



Key Dates for Teams to know:

March 15, 2021 – Written Design Report

March 15, 2021 – Virtual Dynamic 1D Model Submissions for Acceleration, Lab Emissions, Fuel Economy, and Sound

March 25, 2021 – Verbal Design Presentation

March 26, 2021 – Virtual Dynamic 1D Model Judging

On behalf of the Organizing Committee, we thank you for your continued participation and patience as we navigate through this continued pandemic.

# Formula SAE

## Event Structure/Registration

SAE International will operate the 2021 competition season using a Hybrid Model offering student engagement in a 2-Step Registration Process.

### **Step 1 – Formula SAE Knowledge Event**

Registration will open for this ALL-virtual event the week of October 12. It is a requirement to take part in this virtual Formula SAE Knowledge Event to register for the Formula SAE Validation Event that will be held in person. This event will include the following:

- Team Program Overview – January 14, 2021
- Design Review Briefing – March 1, 2021
- Design Spec Sheet – March 1, 2021
- Design 3 View Drawings – March 1, 2021
- Online Vehicle Cost Report Submission – March 29, 2021
- Real Case Scenario Report Submission – March 29, 2021
- Knowledge Presentation Judging – February 4, 2021
- Knowledge Cost Judging – April 19 – 20, 2021
- Knowledge Design Judging – April 21 – 24, 2021

Limit on number of presenters may be enforced; please watch for news feed announcements and emails.

Educational online workshop – Winter Workshop hosted on January 22 – 23, 2021. Not a mandatory requirement.

### **Step 2 – Formula SAE Validation Event**

Registration for this event will open the week of November 18th. It is a requirement to take part in the Formula SAE Knowledge Event to register for this event. This event will include the following:

- Technical Document Submissions – January 20, 2021
  - SES/IAD Submission
  - Electric Systems Form (ESF)
  - EV Class FMEA
  - ETC FMEA (IC Class Only)
- Formula SAE Michigan – @ Michigan International Speedway in Brooklyn, Michigan
- Formula SAE – June 16-19, 2021

Operating the 2021 competition season using the hybrid model will allow for any international team to participate in the competition by participating in the Formula SAE Knowledge Event if travel bans and closed borders remain an issue.

Due to the COVID-19 pandemic the actual execution of the event is subject to change. This document will be updated once new information becomes available. Teams can expect a

scaled-down event in 2021.

Teams will consist of up to ten (10) team members plus one (1) faculty advisor. This limit may be increased at a later time.

Events will be closed to spectators.

#### Registration Fee Structure

Knowledge Event fee – student teams who register during the week of October 12<sup>th</sup> will be required to make payment of \$1550.00 within 48 hours of confirming registration online. Registration fees are non-refundable.

Validation Event fee – student teams who register during the week of November 18<sup>th</sup> will be required to make final confirmation and payment of \$800.00 prior to 60 Days Out from Validation Event date.

Formula SAE Michigan Payment and Registration Confirmation due TBD

Formula SAE Payment and Registration Confirmation due April 16, 2021

Registration fees are non-refundable.

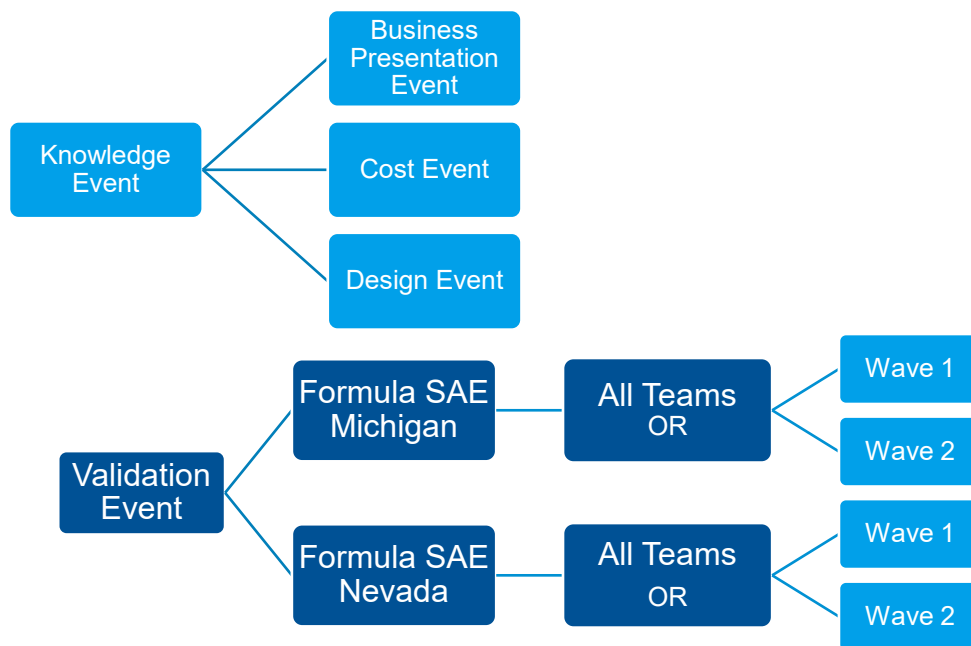
*\*If the competition is cancelled due to COVID-19, SAE cannot guarantee a refund as we begin to make onsite preparations for university teams.*

#### Event Results

At this time, it is SAE International's plan to score the virtual static events hosted during the Knowledge Event as a separate competition resulting in recognition of award winners for both individual events as well as overall accumulative score.

At this time, it is SAE International's plan to score the on-site dynamic events hosted during the Validation Events as a separate competition resulting in recognition of award winners for both individual events as well as overall accumulative score. \*Pending local/state guidelines based on CDC guidelines, the on-site events could see an operation change meaning we could be operating either one large event or several "waves" consisting of smaller number of teams onsite every 2-3 days. SAE will make every effort to keep this process as fluid as possible to best prepare teams, volunteers, and staff.

Below is just an example of what the 2021 season could look like:



SAE cannot stress enough the point that this year, the competition season will need to be flexible in planning to ensure the best experience possible. We may need to make changes as we get closer to onsite dynamic events. We will do our best to keep teams informed and prepared. **Teams are responsible for monitoring emails, news post and Formula SAE App notifications.** We appreciate your patience during this time.

#### Key Dates for Teams to know:

##### **Knowledge Event:**

January 14, 2021 – Team Program Overview Due  
February 4, 2021 – Knowledge Event Judging for Presentation  
March 1, 2021 – Design Review Briefing, Design Spec Sheet and 3 View Drawings Due  
March 29, 2021 – Online Cost Prototype and Real Case Scenario Due  
April 19 - 20, 2021 – Knowledge Event Judging for Cost  
April 21 – 24, 2021 - Knowledge Event Judging for Design  
TBD – Virtual Awards Ceremony

##### **Formula SAE Michigan Validation Event:**

January 20, 2021 – Technical Document Submissions Due  
TBD – Registration Confirmation and Payment Due for Formula SAE Michigan  
TBD – 45 Days from competition – Onsite Logistics Plan Published  
TBD – 30 Days from competition – Official Go/No-Go Announcement Made  
TBD – Validation Event @ Michigan International Speedway in Brooklyn, Michigan  
TBD – Award Ceremony

**Formula SAE Validation Event:**

January 20, 2021 – Technical Document Submissions Due

April 16, 2021 – Registration Confirmation and Payment Due for Formula SAE

May 3, 2021 – 45 Days from competition – Onsite Logistics Plan Published

May 18, 2021 – 30 Days from competition – Official Go/No-Go Announcement Made

June 16 – 19, 2021 – Validation Event

June 19, 2021 – Award Ceremony

On behalf of the Organizing Committee, we thank you for your continued participation and patience as we navigate through this continued pandemic.



# SAE Supermileage

## Event Structure/Registration

SAE International will operate the 2021 competition season using a Hybrid Model offering student engagement in a 2-Step Registration Process.

### **Step 1 – SAE Supermileage Knowledge Event**

Registration will open for this ALL-virtual event the week of October 12. It is a requirement to take part in this virtual SAE Supermileage Knowledge Event to register for the SAE Supermileage Validation Event that will be held in person. This event will include the following:

- Written Design Paper – April 15, 2021
- Oral Design Presentation – May 13 – 14, 2021

Limit on number of presenters may be enforced; please watch for news feed announcements and emails.

Educational online workshop – Winter Workshop hosted on January 22 – 23, 2021. Not a mandatory requirement.

### **Step 2 – SAE Supermileage Validation Event**

Registration for this event will open the week of November 18th. It is a requirement to take part in the SAE Supermileage Knowledge Event to register for this event. This event will include the following:

- Non-scored Design Safety Report - May 10, 2021
- Technical Inspection – June 10 - 11, 2021 @ Eaton Proving Grounds in Marshall, Michigan
- Fuel Economy Rounds – June 10 - 11, 2021 @ Eaton Proving Grounds in Marshall, Michigan

Operating the 2021 competition season using the hybrid model will allow for any international team to participate in the competition by participating in the SAE Supermileage Knowledge Event if travel bans and closed borders remain an issue.

Due to the COVID-19 pandemic the actual execution of the event is subject to change. This document will be updated once new information becomes available. Teams can expect a scaled-down event in 2021.

Teams will consist of up to ten (10) team members plus one (1) faculty advisor. This limit may be increased at a later time.  
Events will be closed to spectators.

## Registration Fee Structure

Knowledge Event fee – student teams who register during the week of October 12<sup>th</sup> will be

required to make payment of \$600.00 within 48 hours of confirming registration online. Registration fees are non-refundable.

Validation Event fee – student teams who register during the week of November 18<sup>th</sup> will be required to make final confirmation and payment of \$350.00 prior to 60 Days Out from Validation Event date. **Payment and Registration Confirmation due April 14, 2021.** Registration fees are non-refundable.

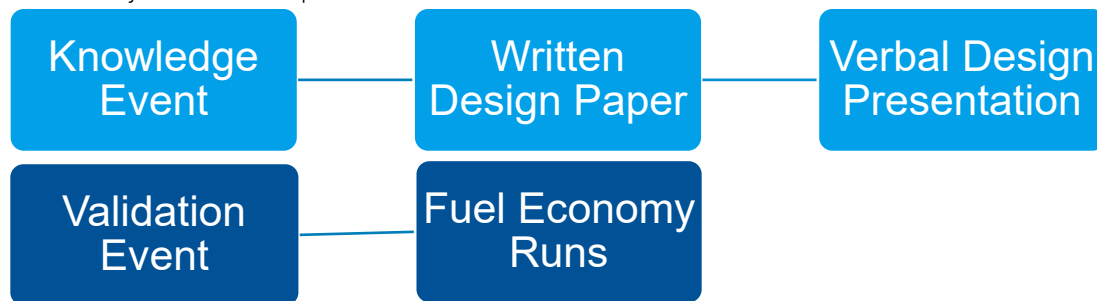
*\*If the competition is cancelled due to COVID-19, SAE cannot guarantee a refund as we begin to make onsite preparations for university teams.*

### Event Results

At this time, it is SAE International's plan to score the virtual static events hosted during the Knowledge Event as a separate competition resulting in recognition of award winners for both individual events as well as overall accumulative score.

At this time, it is SAE International's plan to score the on-site dynamic events hosted during the Validation Events as a separate competition resulting in recognition of award winners for both individual events as well as overall accumulative score.

Below is just an example of what the 2021 season could look like:



SAE cannot stress enough the point that this year, the competition season will need to be flexible in planning to ensure the best experience possible. We may need to make changes as we get closer to onsite dynamic events. We will do our best to keep teams informed and prepared. **Teams are responsible for monitoring emails and news posts.** We appreciate your patience during this time.

### Key Dates for Teams to know:

#### **Knowledge Event:**

April 15, 2021 – Design Report Due

May 13 - 14, 2021 – Knowledge Event Judging for Verbal Design Presentation

TBD – Virtual Awards Ceremony

#### **Validation Event:**

April 14, 2021 – Registration Confirmation and Payment Due

April 29, 2021 – 45 Days from competition – Onsite Logistics Plan Published  
May 10, 2021 – Non-scored Design Safety Report Due  
May 14, 2021 – 30 Days from competition - Official Go/No-Go Announcement Made  
June 10 - 11, 2021 – Validation Event @ Eaton Proving Grounds in Marshall, Michigan  
June 11, 2021 – Award Ceremony

On behalf of the Organizing Committee, we thank you for your continued participation and patience as we navigate through this continued pandemic.