2021
HUMAN POWERED VEHICLE CHALLENGE
COMPETITIONS
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ATTENTION E-FESTERS! Please read this important announcement about ASME E-Fests® in 2021

ASME is excited to host an E-Fest Digital event in April 2021. E-Fest Digital will include career and professional development content, digital competitions (including the Human Powered Vehicle Challenge, the Student Design Competition, the Innovative Additive Manufacturing 3D Competition, the Oral Competition and the Elevator Pitch Competition) and much more! Additional details will be available soon. Questions may be directed to efests@asme.org.

We encourage students, competitors, and faculty members to take advantage of the learning experiences provided by both our competitions and other digital offerings throughout the year. Questions may be directed to efests@asme.org and a digital calendar will be posted on http://efests.asme.org with lots of information.

If local conditions permit, ASME may add an in-person E-Fest competitions-only experience in April 2021. An update on this will be provided on November 7, 2020 during our E-Fest Careers 2020 digital event.

Students are encouraged to download E-Fest competitions rules at https://efests.asme.org/competitions for LIVE and Digital events.

Additionally, ASME will be hosting a series of year-long digital events including a Student & Early Career Town Hall (Sept. 17, 8:00 pm – 9:15 pm EDT), E-Fest Careers 2020 (November 7), webinars and other competitions. Please visit http://efests.asme.org for more details.

Announcements about ASME E-Fest Asia Pacific 2021 and E-Fest Latin America 2021 will be forthcoming and will be posted on http://efests.asme.org.
I. General Information

A) Objective

ASME's Human Powered Vehicle Challenge (HPVC) is an engineering design and innovation competition that gives students the opportunity to network and apply engineering principles through the design, fabrication and racing of human powered vehicles.

B) Competition Summary

ASME and the ASME HPVC Committee will host three independent worldwide competitions in 2021: a Critical Design Review competition (on-line/digital), an Innovation competition (on-line/digital), and an in-person E-Fest Competitions event in North America (if local conditions permit) that will include HPVC. Students are encouraged to participate in one or more competitions, but scores will remain separate between each competition. Scores from each competition will be used to determine the winner for that competition only.

Announcements about ASME E-Fest Asia Pacific 2021 and E-Fest Latin America 2021 will be forthcoming and will be posted on http://efests.asme.org.

C) Competitions and Events

- Critical Design Review Competition (On-line/digital): Teams will be scored on their application of sound engineering principles and practices toward a vehicle design. The objective is to demonstrate design maturity without engaging in fabrication, assembly and testing. This event includes a written report and a technical presentation to be held digitally.
- Innovation Competition (On-line/digital): Teams will be scored based on the specific design, concept evaluation, learnings, and analysis of the proposed innovation related to human powered vehicles. This event includes a written report and a technical presentation to be held digitally.
- HPVC North-America Competition (Live event): This competition will be held in-person (if conditions permit) and will be comprised of the following events:
  - Men’s and Women’s Speed Event: Teams are scored on the speed of their vehicles, either in a flying start 100 meter sprint or a head-to-head drag race from a standing start. The ASME HPVC Committee will announce which event will be held at least 90 days in advance of the competition. Separate scores for men and women are recorded for this event.
  - Endurance Event: Teams are scored on speed, practicality, performance and reliability of their vehicles in a road race format with urban transportation obstacles and challenges.
  - Testing/Safety Event: This event requires a written report documenting physical tests and/or experiments conducted to develop or verify the design. In addition, this event will also include safety and aesthetic scoring.

D) Competition Rules

The rules will be posted on the HPVC website during September 2021.
E) **Questions and Comments About the Competitions/Events**
Questions about the competitions/events must be posted on the HPVC Question Forum listed below.

F) **Location and Competition Information**
Physical locations and Digital platforms for all competitions will be updated on the official HPVC website. Teams wishing to participate should consult the HPVC website, ASME HPVC Community on Facebook, and HPVC Questions Forum.


HPVC Facebook Community:
- [http://www.facebook.com/ASMEHPVC](http://www.facebook.com/ASMEHPVC)
- [https://www.facebook.com/groups/ASMEHPVC](https://www.facebook.com/groups/ASMEHPVC)

HPVC Question Forum: [https://groups.google.com/g/asme-hpvc](https://groups.google.com/g/asme-hpvc)

G) **Definitions**

**Competition**: an individual HPVC hosted physically at a location around the world (e.g. HPVC West) or digitally (eg. Critical Design Review)

**Event**: an element of the competition (e.g. Speed Event)

**Team**: a group competing in the competition consisting of a vehicle and team members

**Vehicle**: a single entry in a competition

**Individual**: a single participant of a competition and likely a team member

**Driver**: any individual who is or will be riding in a vehicle during a competition

**Competitor**: an individual who is competing in a specific event at a competition (ie driver, presenter, team member)

**Registration**: the process to collect fees and record individual and vehicle information by ASME

**On-line/digital Event**: an event that will be held on a digital platform rather than meeting in-person at a physical location

**Live Event**: an event that will be held at a physical location requiring individual/team presence
**H) Schedule Summary & Host Information**

The ASME HPVC website shall specify all the important dates and contact information for the relevant competition.

The following is required for participation in the ASME Human Powered Vehicle Challenge. The required materials must be submitted as indicated in accordance with the schedule as noted. Please refer to the ASME HPVC website for exact dates, submission links, and registration instructions. https://efests.asme.org/competitions/human-powered-vehicle-challenge-(hpvc)

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Method of Submission and Format</th>
<th>Date Due</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Critical Design Review Competition</strong></td>
<td></td>
<td></td>
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<tr>
<td>Critical Design Review Registration</td>
<td>Every team must register online via E-Fest website</td>
<td>30 days before Critical Design Review report deadline</td>
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<tr>
<td>Critical Design Review Report</td>
<td>Electronic submission via competition website</td>
<td>30 days before the Critical Design Review presentation</td>
</tr>
<tr>
<td>Critical Design Review Presentation</td>
<td>On-line/digital</td>
<td>Early 2021</td>
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<tr>
<td><strong>Innovation Competition</strong></td>
<td></td>
<td></td>
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<tr>
<td>Innovation Registration</td>
<td>Every team must register online via E-Fest website</td>
<td>30 days before innovation report deadline</td>
</tr>
<tr>
<td>Innovation Report</td>
<td>Electronic submission via competition website</td>
<td>30 days before Innovation presentation</td>
</tr>
<tr>
<td>Innovation Presentation</td>
<td>On-line/digital</td>
<td>Spring 2021</td>
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<tr>
<td><strong>HPVC North America (Live event)</strong></td>
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<tr>
<td>Vehicle Registration</td>
<td>Every team must register online via E-Fest website</td>
<td>14 days before testing report deadline</td>
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<tr>
<td>Testing Report</td>
<td>Electronic submission via competition website</td>
<td>45 days before the live competition</td>
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<tr>
<td>Individual Registration</td>
<td>Every team member must register online via E-Fest website</td>
<td>1st day of live competition</td>
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<td>Individual Ride Log</td>
<td>Every driver must submit online via competition website</td>
<td>1 week before live competition</td>
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<tr>
<td>Performance Safety Video</td>
<td>Electronic submission via competition website</td>
<td>1 week before live competition</td>
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<tr>
<td>Safety Exemption Request</td>
<td>Submit only if an exemption is requested and submit to Head Judge</td>
<td>1 week before live competition</td>
</tr>
<tr>
<td>Live Competition</td>
<td>In-person</td>
<td>Spring 2021</td>
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<tr>
<td><strong>Protests</strong></td>
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<tr>
<td>Protests</td>
<td>Submit to Head Judge only if required</td>
<td>In accordance with HPVC 2021 rules (refer section 1.D)</td>
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II. Entry and Registration

A) Team Eligibility
Entry in all competitions of the 2021 Human Powered Vehicle Challenge is open to teams from any college or university in the world.

B) Team Member Eligibility and Certification
All members of the respective school’s team must be enrolled as full-time students in any program of study at that school. Any individual that is currently a full-time student, enrolled for the next upcoming semester/quarter, or has been enrolled for the previous semester/quarter, but graduated no earlier than six months prior to the competition date, is eligible to fully participate in any ASME HPVC competition. The faculty advisor and team captain must be from the engineering department of the college or university.

C) Multiple Entries
Multiple teams are allowed from a single university provided that they have different captains and team members. For the live event, teams must have different captains and drivers. Each individual driver may only race in one vehicle for each racing event. In other words, **no driver should compete in multiple entries for any single racing event.**

D) Individual and Vehicle Registration Fees
The registration fees for the competition may differ depending on the competition. The specific fees and more information including where to direct your questions will be outlined on the competition and E-Fest websites ([https://efests.asme.org/](https://efests.asme.org/)).
III.  Results and Awards

A) Announcement of Results
The judges will post the results of each event of the competition as soon as possible after the completion of the respective event and validation of the collected data.

B) Presentation of Awards
The awards presentation (digitally or physically) will be held after the completion of the competition's final event.

C) Competition Awards
Competition awards shall be given as follows:

- Critical Design Review  
  1\textsuperscript{st} + $500, 2\textsuperscript{nd} and 3\textsuperscript{rd} place awards

- Innovation Event  
  1\textsuperscript{st} + $500, 2\textsuperscript{nd} and 3\textsuperscript{rd} place awards

- Live Competition (Testing/Safety + Racing)  
  1\textsuperscript{st} + $500, 2\textsuperscript{nd} and 3\textsuperscript{rd} place awards

In addition to the above, there are event specific awards for the live competition:

- Men’s Speed Event  
  1\textsuperscript{st} + $250, 2\textsuperscript{nd} and 3\textsuperscript{rd} place awards

- Women’s Speed Event  
  1\textsuperscript{st} + $250, 2\textsuperscript{nd} and 3\textsuperscript{rd} place awards

- Endurance Event  
  1\textsuperscript{st} + $250, 2\textsuperscript{nd} and 3\textsuperscript{rd} place awards

Overall winner for the Live competition must participate, complete minimum requirements and score points in all events of the live competition to be eligible for monetary awards.

Winners for the CDR/Innovation Competition must participate, complete minimum requirements and score points in report and presentation in the respective competition to be eligible for monetary awards.

Minimum requirements for all competitions are valid non-zero scores in all events for that specific competition.