

# FORMULA STUDENT

Institution of  
**MECHANICAL  
ENGINEERS**

## Dynamic Events

Dynamic Tests – tilt table, brake test, skid-pad, acceleration, sprint & the 22km endurance – are all manned for safety and car recovery by qualified and experienced race marshals. The event management side is handled by FS volunteers. It is this group of volunteers who work with the time keepers and the event results team to ensure that the correct scrutineering clearances and accurate penalty points data is captured. This team usually work out on track alongside the safety marshals, reporting in on hit cones or off track excursions by the competing cars. Both the volunteers and marshals are key to enabling the event to run – without them there would be no event.

### Volunteering with the dynamic events will:

- Make you a valued part of a team that runs one of the most unique events in the world
- Give you valuable and varied experience to bolster even the best of CVs
- Help you achieve your competencies if you are working towards Chartered status

### Tilt Table

This is a scrutineering requirement where the fluid leakage and roll-over potential of the vehicles is tested using a tilting platform. All cars are required to pass these tests before they are allowed to run.

### Brake test

This is a scrutineering requirement where the braking performance of the car is tested. All cars must accelerate hard and then lock up all four wheels simultaneously before being allowed to run in the racing events.

### Acceleration

The goal of the Acceleration event is to measure the vehicle's maximum acceleration capability by measuring the total time required for the vehicle to travel a straight distance of 75m from a standing start on flat ground – similar to a drag style event. The event is designed to focus on the vehicle's engine performance and drivability, and on the suspension design characteristics for the ability to provide maximum tyre grip.

### Skid Pad

The goal of the Skid Pad event is to measure the vehicle's maximum cornering capability by measuring the total time required for the vehicle to complete a figure of eight circuit. Two drivers are allowed per car, 2 runs per driver. Each run consists of a driver completing 2 right-hand laps immediately followed by 2 left-hand laps of the course. After a driver's first run, he/she has the option of immediately taking a second run on the same skid pad, or leaving the staging area and running later in the session. This option is often taken up if the team wish to tweak any element of the car after receiving telemetry read outs.

### Sprint

The Sprint event is designed to test the car's manoeuvrability and handling qualities on a tight course without the hindrance of competing cars. Cars must pass the sprint in order to qualify for the endurance. Two drivers are allowed per car with two runs per driver; the fastest of the four runs, including penalties (from knocked cones or off course occurrences) will be used to calculate the score for each car. After the first run, each driver has the option of taking the second run immediately, following the same staging procedure and at the discretion of the marshal, or leaving the staging area and running later.

## **Endurance & Fuel Economy**

The goals of the endurance and fuel economy event are to test the durability of the vehicles and determine their fuel efficiency. The course layout and 22 km (13.75 miles) length of the event tests the vehicles durability. Two drivers each run half the distance with the changeover at 11km at which point the car must enter the driver change area and switch off the motor/engine. Once stopped Scrutineers perform interim safety inspections. The teams (limited to one representative plus two drivers) must change drivers in under 3 minutes beyond which penalties for being slow are applied. The only exception to this is if the scrutineers hold the car on technical grounds. No repairs may be made and only adjustments for driver comfort and necessary tyre changes (dry to wet or vice-versa) may be undertaken. No refuelling is allowed at any point of the event and the cars must start with a full tank or electrical charge. Upon completing the last lap with the second driver, the chequered flag will be displayed, the vehicle will exit the course and be accompanied to the fuelling station. The vehicle is to be pushed to the fuelling station where the fuel economy will be calculated. A certificate of the fuel volume will be issued. As with the other dynamic events penalty points are awarded for displacing cones and off course occurrences which get factored into the overall finishing time.

## **Volunteer roles**

- Event Captain – supported by the Chief Event Captain and controls the event.
- General Volunteer – assists the Event Captain to run the event smoothly, recording driver numbers, etc.
- Assistant Event Captain – there are two ‘figures of eight’ running concurrently in the Skid Pan so this role replicates the Event Captain for one of the 8s.
- Cone Counters – are based out on track and provide race control with cone and off course penalties for the cars. They are also vital for spotting and reporting via radio early signs of problems with the cars.
- Dynamic Area Captain – is responsible for the organisation of the cone counters.
- Start Line Captain – controls the entry of cars onto the track and records and reports driver numbers to race control.
- Gate Guard – controls the entry of teams to the event staging area. This person will be asked all sorts of questions by the teams that will try and get the best advantage for themselves.
- Race Control – record, collate and ratify all the penalties and times for the teams.
- Course Designer – designs the tracks to fit into the areas available and to the specifications within the rules and as safely as possible and is responsible for setting out the course along with the Clerk of the Course and assistants. This is quite the design challenge.
- Driver Change Captain – controls the driver change area including the driver change time keepers and driver change assistants. This person also liaises with the event captain and clerk of the course to help with decision making regarding the removal of teams from the event. This position probably requires the highest energy and excitement levels.
- Driver Change Assistant – supports the Driver Change Captain to turn around the cars quickly and efficiently. This is one of the more high energy, high excitement positions.
- Driver Change Time Keeper – supports the Driver Change Captain to time the duration of each team’s driver change – there is a limit to the length of time each team has and there is always the anticipation... Will the car start again?!

## **Experience required**

Some experience of being an Event Captain, Start Line Captain or Race Controller would be required to fulfil these specific roles single handedly, however anyone without experience but with the desire to develop into these roles will be actively encouraged and supported.

To apply to be a Dynamic Events Volunteer at Formula Student 2025 please click [here](#).