

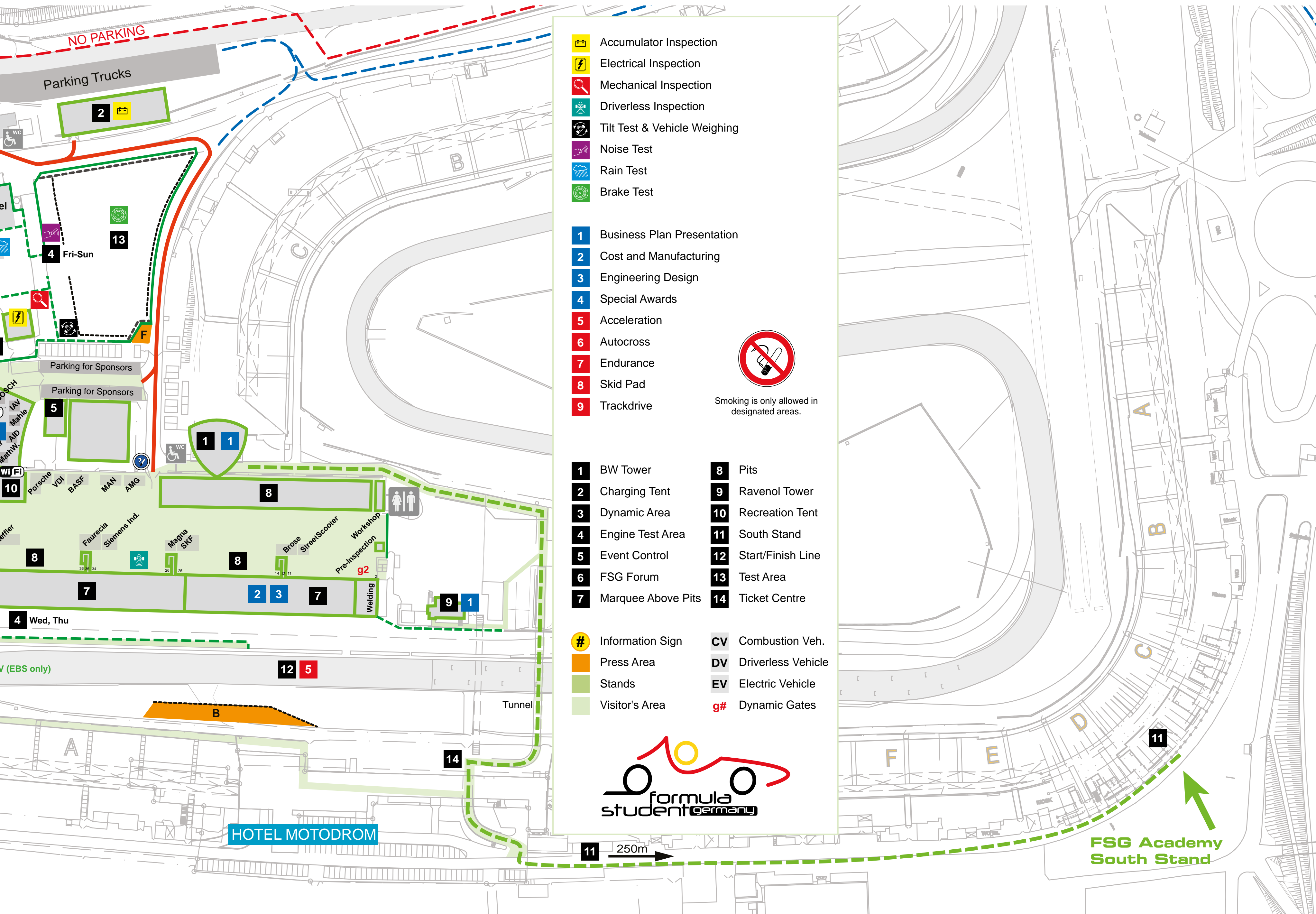
# FSG ACADEMY ON SITE

20 workshops free of charge for 25 students each, provided by our partners. Please register for each on the booth of the partner.

## FSG Academy - a successful story...

The FSG Academy organises workshops and lectures for the students throughout the year. Since 2016 there are workshops at the FSG event! These workshops will be offered to this years participants by the partners of Formula Student Germany. They will give students even more opportunities for further training and to gain expertise on various topics. So take the chance and sign up for these free workshops!

Any Questions?  
Please ask for Esther Tromp in the FSG Forum or write an email to [academy@formulastudent.de](mailto:academy@formulastudent.de)



## Wednesday, 8th of August

10:45 - 12:15 - South Stand Room A **MathWorks**

### Model-Based Design for Formula Student with Simulink

Development of a Formula Student race car is bound to a tight schedule. Therefore it is hugely important that your first prototype is optimized using simulation and testing to rule out software errors. Model-Based Design helps to speed up the development of your race car. This widely used workflow allows you to model your vehicle to perform analysis and system optimization through simulation. You can tune your control strategies, and automatically create code to run on your hardware.  
*Eva Pelster*

13:00 - 14:30 - South Stand Room B **Siemens**

### Testing – the Difference between success and failure

More and more properties are to be validated and this in less time. An additional challenge is that you only can perform a test with hard- and software. This is typically only possible late in the development process. Changes at this time are very expensive and inefficient. Our tool landscape allows to manage this ultra-high performance task(s). This presentation should give an impression of the spirit we follow, show an overview over the important tools and go deeper in our portfolio for measurement systems and test examples.  
*Marc Maendl*

13:00 - 14:30 - South Stand Room B **Daimler**

### Develop and test future cars – from your desk

Driving Simulation-Software.  
*Johannes Lächele*

14:45 - 16:15 - South Stand Room A **MathWorks**

### Vehicle Modeling for Formula Student

Creating a virtual prototype of your race car is essential to saving time on a tight development schedule. Through vehicle modeling you can evaluate your design ahead of having your first real prototype. The simulation can be used find bugs early, compare different variants and find the best configuration for maximum scores, or optimize the system performance. In this session you will learn how to use different MathWorks tools such as Simulink, Simscape and Powertrain Blockset to model your vehicle.  
*Eva Pelster*

14:45 - 16:15 - South Stand Room B **Porsche**

### CAE Body Simulation @ Porsche

We are going to give a brief overview about the CAE Process and the simulations carried out at the Porsche AG. The focus will be set on our major activities from crash simulations over optimization and big data analysis right up to fluid simulations. Furthermore, we will set focus on the qualifications you need to start you internship or thesis with us.  
*Dr. Michael Hedwig & Dr. Pit Schwanitz*

16:30 - 18:00 - South Stand Room A **Siemens**

### Simulating Aerodynamics with Simcenter STAR-CCM+

The complete workflow for simulating the aerodynamics of a race car will be presented during a live software demonstration, including geometry preparation, meshing, choice of appropriate physical models and post-processing. Case studies, best practices and user experiences will be addressed to show the capabilities of Simcenter STAR-CCM+ for a detailed and trustworthy investigation of the complex physical phenomena involved in the aerodynamic investigation of race cars.  
*Claudio Santarelli*

## Thursday, 9th of August

09:00 - 10:30 - South Stand Room A **MathWorks**

### Model-Based Design for Formula Student with Simulink

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*Eva Pelster*

09:00 - 10:30 - South Stand Room B **Siemens**

### Virtual Driverless Track Testing with Siemens' PreScan

PreScan is a physics-based simulation platform that is used in the automotive industry for development of autonomous driving systems and Advanced Driver Assistance Systems (ADAS) that are based on sensor technologies such as radar, laser/lidar, camera and GPS. PreScan can be used from model-based controller design (MIL) to real-time tests with software-in-the-loop (SIL) and hardware-in-the-loop (HIL) systems. It is an essential tool for efficient development of driverless automation systems.  
*Victor Ho*

10:45 - 12:15 - South Stand Room A **SKF**

### Automotive Business @ SKF

Everything that keeps a car rolling. From wheel ends to transmission, clutch, suspension, engine and e-powertrain.  
*Daniel Back + Julian Veeh, Automotive Application Engineers*

10:45 - 12:15 - South Stand Room B **Brose**

### Workshop: Boosting the development process with simulation

Together we will compile how the combination of simulation and model-based system engineering can help improving your race car development.  
*Martin Tupy, Michael Buchheim*

13:00 - 14:30 - South Stand Room A **Faurecia**

### Transient flow noise simulation CFD

Flow noise is an extremely annoying component of tailpipe noise at high mass flow rates. It is caused by local turbulence and pressure fluctuations. By means of transient CFD (Detached Eddy Simulation) it is possible to resolve these fluctuations in space and time. The impact of the muffler design on the flow noise is demonstrated in this workshop.  
*Dr. Rolf Kaiser*

14:45 - 16:15 - South Stand Room B **Magna**

### Simulate your future - Design & Functionalities of Exteriors

Simulation methods for process and design simulation and optimization for future Exterior products. New product design simulations for Aerodynamic parts (CFD features etc.) New product design optimization for plastic parts (Bionic structures and Optistruct etc.) Process simulations for Composite parts, Galvanic products and injection moulding warpage prediction etc.  
*Johannes Goetzelmann, Director Products and Process Development, Magna Exteriors*

14:45 - 16:15 - South Stand Room A **Porsche**

“From worldwide racetracks to Formula Student – Simulation of Li-Ion batteries” Simulate your future - Design & Functionalities of Exteriors

## Friday, 10th of August

09:00 - 10:30 - South Stand Room B **MathWorks**

### Vehicle Modeling for Formula Student

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*Eva Pelster*

13:00 - 14:30 - South Stand Room A **Siemens**

### Electrical System & Harness Design

Overview on creating Electrical systems design and schematics data Wiring designs including data exchange to MCAD 3D Harness design including data exchange to MCAD 3D Formboard design Required documentation, Questions & Answers.  
*Hodei Osacar*

13:00 - 14:30 - South Stand Room B **Porsche**

### „How to make a Difference at Porsche“

An insight into the locking differential setup process of the Porsche LMP1 Team. Discover which kind of methods are used to setup the front and rear axle differential of a three times Le Mans winning and record breaking race car. Learn more about the possibilities to use simulation tools and their interaction with the driving simulator, test benches and in car testing.  
*Thomas Schnermann, Porsche Motorsport LMP Team*

14:45 - 16:15 - South Stand Room A **MathWorks**

### Developing Automated Driving Systems with MathWorks Tools

Developing Automated Driving Applications with MATLAB and Simulink In this session you will learn how MATLAB® and Simulink® provide a development environment for components in Advanced Driver Assistance Systems (ADAS) and Automated Driving (AD) applications. You will see examples that you can use to get started developing:  
• Vision detection algorithms with deep learning  
• Sensor fusion algorithms with recorded and live data  
• Longitudinal (ACC) and lateral (LKA) control algorithms with synthetic sensor data  
*Dr. Christoph Hahn*

14:45 - 16:15 - South Stand Room B **Faurecia**

### Avoid failure of exhaust line

When designing exhaust systems regarding durability, various types of loads come into play. The gas and mass forces of the engine cause engine-speed dependent dynamic excitation of the exhaust system which occurs at relatively high frequencies and calls for a high cycle fatigue resistant design of the exhaust system for resonant frequencies. Within this workshop, we will discuss how to find the best compromise recognizing all the demands.  
*Burkhard Göttlicher*

16:30 - 18:00 - South Stand Room A **IAV**

### Vehicle-in-the-Loop (ViL): Augmenting real-world testdriving

IAV's Vehicle-in-the-Loop test method is able to significantly enhance the validation of active safety and automated driving systems. It closes the gap between simulated and real-world tests and enables to efficiently and reproducibly test active safety and automated driving systems within traffic scenarios that are too complex or too dangerous for real driving tests. The test method is based on combining a real-world test vehicle with virtual objects and scenarios that are directly injected into the vehicle, displayed via an augmented reality app by IAV.  
*João Graciano*

16:30 - 18:00 - South Stand Room B **Continental**

### Efficient combination of simulation and experimental tools

Join this workshop in order to learn from examples, how the combination of simulation and experimental methods can accelerate the development process and thereby improve the function and robustness of automotive components and systems.  
*Dr. Raphael Distler*



# FORMULA STUDENT GERMANY

## INTERNATIONAL DESIGN COMPETITION