INFOFOLDER

TUW racing
VIENNA FORMULA TEAM

OUR TEAM

100 MEMBERS

Our large number of members brings a broad base of knowledge and motivation to learn more.

30 DEGREE PROGRAMMES

From Mechanical Engineering to Scandinavian Studies – diversity gives our team the decisive edge.

1 RACING CAR

The goal: to jointly develop and manufacture a racing vehicle and to put it to the test at international events.

//OUR HISTORY

From idea to sucess

It all started with a dream! Founded as the second youngest Austrian student racing team in 2007, we took part in international Formula Student competitions for the first time in 2008 with an independently developed and constructed vehicle.

What started out as a small group has since developed into a real extended family: The team now consists of 100 members from various study programmes and diverse nationalities who are enthusiastic about racing.

From the classics of Mechanical Engineering, Electrical Engineering and Computer Science to Economics and Scandinavian Studies, everything is represented here. These different study backgrounds bring a range of knowledge with them and shape the very special and unique team spirit.

TU Wien Racing is a family that not only shares the fascination of racing, but also their experience, knowledge and skills. A team that grows together through its challenges and offers students the opportunity to put their theoretical knowledge into practice.

Working together and looking forward to exciting Formula Student events is what drives the team!

//FORMULA STUDENT

The student engineering competition

Around the world, young engineers work in more than 600 teams on innovative racing vehicles and push technical possibilities to their limits.

All this to compete with the international competition of the world's best universities during the summer. 8 different disciplines show who can score with the best overall package of well-considered development, precise implementation and efficient financial planning. Only those teams that have mastered both dynamic and static disciplines can finish at the top of the overall competition ranking.

DYNAMIC DISCIPLINES

- Acceleration
- AutoX
- Efficiency
- Endurance
- Skid Pad

STATIC DISCIPLINES

- Business Plan Presentation
- Cost and Manufacturing
- Engineering Design

EDGE MKI
2008

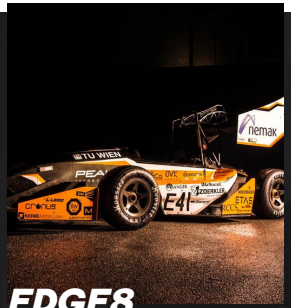
EDGE MKIII
2011

EDGE6
2014

//EDGE14
2023

- **180kg total weight**
  Accumulator included
- **80kW power**
  4 electric motors with max. 30kW each
- **2.5s from 0 - 100 km/h**
  Final speed at approx. 120 km/h

The now 14th generation of the EDGE is based on the experiences of the EDGE13 season. Proven structures have been further optimised and built on existing knowledge.



EDGE8
2016

EDGE10
2018

EDGE11
2019

EDGE12
2021

EDGE13
2022

//OUR ACHIEVEMENTS 2023

1ST Overall Statics
Budapest, HU + Zagreb, HR

1ST Business Plan
Budapest, HU + Zagreb, HR

2ND Business Plan
Spielberg, AT

2ND Efficiency
Zagreb, HR

3RD Engineering Design
Budapest, HU + Spielberg, AT

4TH Engineering Design
Zagreb, HR

4TH Cost Report
Zagreb, HR

5TH Acceleration
Budapest, HU

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In 2023, we were able to improve our position in the world rankings by over 30 places. This would not have been possible without the support of our sponsors.

//OUR ACHIEVEMENTS

An insight into over 15 years of team history

1ST Acceleration
2022 - Novi Marof, HR

1ST Engineering Design
2022 - Novi Marof, HR

1ST Business Plan
2021 - Novi Marof, HR

2ND Efficiency
2021 - Hockenheim, DE

2ND Autocross
2021 - Novi Marof, HR

3RD Overall
2022 - Novi Marof, HR

3RD Skidpad
2021 - Novi Marof, HR

4TH Endurance
2022 - Novi Marof, HR

We are proud of all the awards we have achieved together in the last 16 years of team history. After every season we reflect our results and set our ambitious goals for the next year`s EDGE.

//SPECIAL AWARDS

Hydrogen Concept Award
2023 - Zagreb, HR + Spielberg, AT

Best Use of Composite
2022 - Spielberg, AT

EDAG Efficiency Award
2022 - Spielberg, AT

Best Electronics Design
2021 - Novi Marof, HR

Clean Mobility Award Winner
2016 & 2017 - Spielberg, AT

Best Use of Adhesives
2013 - Hockenheim, DE

Best Self-Made Vehicle
2012 - Győr, HU

Best Engineered Car
2008 - Silverstone, GB

It is only through interdisciplinary teamwork that we manage to turn our plans into reality and achieve our ambitious goals.

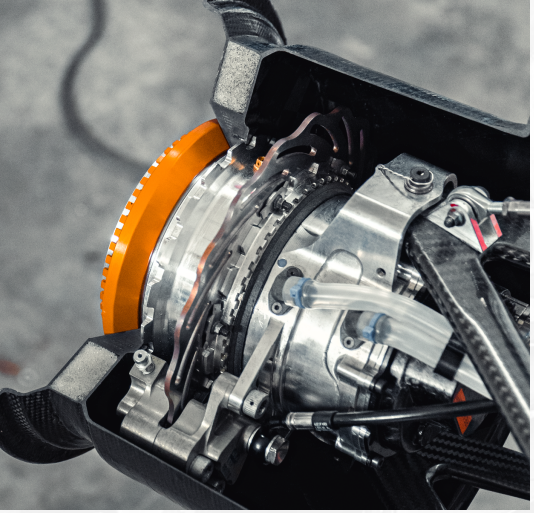
//OUR TEAM STRUCTURE

Together towards our goal

Organised and structured work is very important at TU Wien Racing. In order to implement the complex undertaking of the development and production of a racing car, holistic planning and the know-how of a wide range of disciplines are required.

The division into mechanical, electrical and organisational modules ensures a clear distribution of tasks and rapid progress in the tightly packed schedule.

Nevertheless, our members also engage in interdisciplinary work and further their education through internal training courses to achieve a holistic understanding of our race car.



ELECTRICAL

- Accumulator
- Driverless
- Electronics
- Powertrain
- Vehicle Dynamics & Data Analysis

MECHANICAL

- Aerodynamics
- Chassis
- Composites
- Suspension
- Motor

ORGANISATIONAL

- Finances
- Human Resources
- IT
- Marketing
- Sponsorship

TECHNOLOGY

EDGE

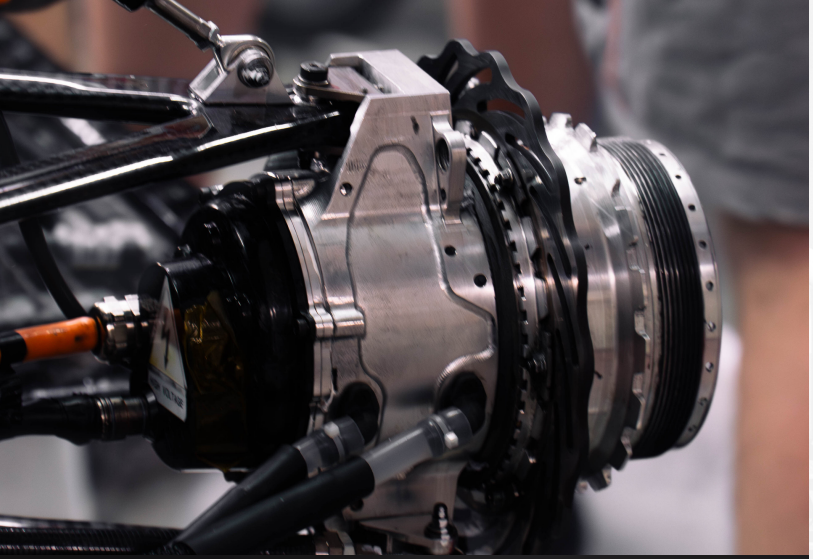
The name says it all. EDGE represents a quality or a factor which gives superiority over close rivals.

IN-HOUSE DEVELOPMENT

As a team of students, we do not shy away from any challenge and put great emphasis on parts from our own development. Only a few standard parts have to be purchased externally.

CONSTANT OPTIMISATION

Each EDGE is the result of many years of accumulated knowledge, carefully passed on and developed from season to season.



//MOTOR

Since our very first electric vehicle, we have been proud to power our EDGE with specially developed permanent magnet synchronous motors. Currently in its 7th iteration, we are achieving a power density of over 20kW/kg at a weight of 2.2kg per wheel by using high performance materials and repeatedly optimised design. This way we achieve a maximum efficiency of 97%. Working with a specially developed optimisation tool chain allows us to make even more improvements in the future.

//VEHICLE DYNAMICS & DATA ANALYSIS

Our control systems are designed to use the full potential of the separately driven wheels (4WD). Launch Control, Torque Vectoring (active torque distribution in corners), Traction Control and Heat & Energy Derater (temperature and range control). Additionally, all sensors such as tire temperature and contact force are analysed in real time to enable predictive control and maintenance. All systems have been simulated, tested and optimised in advance.

//DRIVETRAIN

The low weight of our motors is made possible by working at a very high rotational speed and thus relatively low torque. To utilize the torque of the motor optimally on the track, a specially developed planetary gear is used, which is located directly in the wheel hub. The integrated oil lubrication ensures that the gearbox can always work in its optimal operating condition.

//INVERTER

With our SiC-based inverter technology, we set the standard for highest performance and efficiency. Our self-developed and self-built inverter enables a further increase in performance compared to the previous iteration, which already worked with impressive peaks of up to 90A. Through precise tuning and innovative technologies, we realise efficient energy use with a focus on continuous optimisation and further development to push the boundaries of electric mobility.

//ACCUMULATOR

Our accumulator is based on the principles of maximum efficiency, the highest possible energy density and lightweight construction. A specially developed battery management system enables us to automatically include high-resolution information on the condition of the battery in vehicle controls decisions and to view the data at any time in our live telemetry. Furthermore, thanks to the precise modeling of the cells, the state of charge can be determined at any time via their internal resistance.

//DRIVERLESS

For participation in driverless competitions, the Driverless module develops an autonomous system. With the help of data from a Lidar sensor and other sensor data, we can calculate the exact position of the EDGE on the track. Another algorithm then provides the optimal path to complete the respective discipline as fast as possible. To follow this path, the vehicle control system ensures the correct steering angle and the necessary speed.

//SUSPENSION

The extensive use of carbon fiber composite materials enables optimal driving characteristics thanks to high rigidity despite the low weight. This can be seen especially in our specially developed carbon rims and wishbones. The self-developed wheel carriers serve as housings for the gearboxes and motors. In addition, a good coordination with the driver is necessary to find out the optimal setup for the individual disciplines.

//CHASSIS

Our monocoque is the vehicle's largest cohesive structure, encasing not only all of the internal components but also the driver. It is a load-path-optimized, carbon-fiber-reinforced sandwich component with integrated firewalls and a crash-optimised front structure. In addition to the design for maximum safety, weight and performance are driven to their optimum in our development and enable the connection of the most heavily loaded components of the chassis and the aerodynamic components.

//AERODYNAMICS

The aerodynamic package of our racing car consists of the elements of the front wing, rear wing and underbody. The special arrangement of the carbon elements directs the airflow around the vehicle as efficiently as possible, while at the same time generating maximum downforce. The forces generated are so high that you could theoretically drive the EDGE upside down on the ceiling at a speed of 110 km/h!

//BECOME PART OF THE TEAM

Strong partnerships as the basis for success

The realisation of a project of this scale could not be done by us alone. For this reason, our team relies on countless strong partnerships that enable us to bring our developments to the race track.

The close, joint cooperation with our partners allows a valuable exchange of technology, information and experience, which is beneficial for both sides and the basis for a successful season.

SHOW PRESENCE

Whether at Austria's largest industrial trade fairs, at Vienna's universities or in social networks - you are proudly represented everywhere thanks to our partnership.

MAKE CONNECTIONS EARLY

After graduating, our members end up in top companies in a wide variety of industries - get in touch with future employees or customers today.

EXPERIENCE TRACK DAYS

Join us at the Formula Student competition at the Red Bull Ring or the Sponsor Day organised especially for you - experience the pure racing feeling.

ESTABLISH CONTACTS

Our broad partner network is presented at our events - take the opportunity and exchange ideas, experiences and contacts.

PROMOTE TALENT

The promotion of young talents is something you can be proud of – let our partnership be a part of your CSR measures.

SHARED SUCCESS

Our success is also your success - inspire your employees by contributing to our project and be proud of the final product on the race track.


BMW
GROUP
Werk Steyr

MINI

REAL
PEOPLE.
REAL
BUSINESS.
EFS
CONSULTING

PRÄZISION
JHRMANN

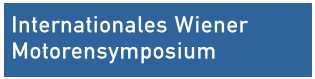
hp

MAGNA
Forward. For all.

MERTEN
GRUPPE

PEAK
TECHNOLOGY

TU
WIEN


Internationales Wiener
Motorensymposium

MouldTech
Systems

SFK

RAPID PRODUCT
RPD
DEVELOPMENT GmbH

DISTech

DMG MORI

Collini

htl Mödling

PFERD

4a

Mechanical
MASCHINENBAU GmbH

Mitutoyo

STIWA
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EGSTON
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TEST

GRAND GARAGE

BOSCH
Technik fürs Leben

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Forschungsunternehmen
-der FH Wiener Neustadt-


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CERAMDIS
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A BOSSARD COMPANY
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finding a better way ...
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ProFEMAG
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TECHNOLOGY
PALFINGER
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