MSc
RACE CAR



MONLAU
MOTUL
TECHNICAL SCHOOL


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Jaime Serrano
General Director

Monlau Motul Technical School was founded in 1997 as part of the Monlau educational group, which has over 35 years of experience in education and training.

We are Spain's pioneering school in technical training for professional motorsport. We currently have more than 470 students enrolled in our programmes, including Car and Motorcycle Racing Mechanics courses and our **Master's Degree in Motorsport Engineering.**

In 2010, we launched the first Master's Degree in Motorsport Engineering, bringing together an outstanding team of highly qualified instructors, each specialising in different modules of the programme and actively working in leading national and international motorsport championships.

Today, **Monlau Motul Technical School** has established itself as a leading institution in the training of racing technicians and engineers in both car and motorcycle racing. Our comprehensive educational approach covers all areas of motorsport, preparing professionals for every level of the industry.

Throughout each racing season, we take great pride in seeing former students, who once began their journey in our classrooms, working as professional race mechanics and engineers in the paddocks of major racing circuits around the world. As an educational institution, there is no greater satisfaction than witnessing their success.

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Motorsport is a highly demanding industry that requires total commitment from everyone involved, both inside and outside the garage. Just as professional racing drivers constantly train and prepare to compete successfully in championships, engineers and technicians must follow the same approach, applying the same working methods, dedication and technical knowledge.

OBJECTIVE

We will give you an insight into the day-to-day experience of a professional motorsport engineer. You will step into a racing garage, become familiar with its technical language and gain a deeper understanding of the world of car racing.

HIGH-LEVEL TRAINING

Our teaching staff consists of highly experienced professionals and active motorsport technicians who work at racing circuits and compete in leading national and international championships.

ENTRY REQUIREMENTS

1. A passion for motorsport.

2. Choose your preferred Master's Degree programme, click "Enrol Now", complete the registration process, and we will send you your login credentials.

3. Log in with your student account and enjoy a new learning experience that will help you take your motorsport career to the next level.

NO FIXED SCHEDULES

Learn at your own pace.

Organise your schedule and enjoy the different modules included in your chosen Master's Degree programme.



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AUTOMOVILISMO

PLAN DE ESTUDIOS

1. MOTORSPORT INTRODUCTION AND RACING TEAM

In this introductory module, you will explore the history of motorsport, from its origins to the present day. You will also learn about the different FIA organisations and racing categories, both past and present, and examine various sporting regulations that have shaped the sport over the years.

This first module will provide you with a solid foundation and help you develop a deeper understanding of the fascinating world of motorsport.

Through this module, you will also discover how modern motorsport teams are structured and organised, gaining valuable insight into the professional environment you could one day be part of. You will learn about the roles, responsibilities and daily tasks of the key members of a racing team.

2. PARTS LIST: RACE CAR

It is essential that you can identify and understand the different components of a racing car whenever they are mentioned. In this module, we will introduce the main components of a single-seater racing car and explain their functions. This module will also serve as a technical glossary, helping you become familiar with the terminology used every day inside a racing garage.

3. RACE CAR DYNAMICS

One of the key responsibilities of a motorsport engineer is making decisions about vehicle setup. In this module, you will learn how different vehicle parameters affect its performance and handling. We will explore the importance of tyres and their crucial role in racing.

You will also learn how to perform various calculations and follow the essential steps required to achieve an optimal vehicle setup.





4. RACE CAR DATA ACQUISITION

To provide accurate feedback to our drivers and understand the behaviour of our racing car, it is essential to work with objective data. In this module, we will explore the components of a data acquisition system and analyse practical examples that will help you understand, interpret and make effective use of the information collected.

5. RACE BRAKES

Achieving the fastest lap time and maximising performance is not just about speed and power. Braking performance can be a decisive factor during a race. In this module, we will explore the different components of a braking system, identify common issues and learn how to solve them. You will also learn how to perform the necessary calculations to achieve optimal braking performance.

6. RACE SHOCK ABSORBERS

Suspension components play a crucial role in vehicle dynamics and, consequently, on-track performance. In this module, we will explore the different suspension components and types of shock absorbers, helping you gain a deeper understanding of how they work and how they influence the handling and performance of a racing car.

7. RACE CAR ENGINE

The engine is one of the most important components of a racing car. In this module, we will explore the different types of engines, their main components, and the essential steps and calculations involved in engine preparation and performance optimisation for motorsport.

8. RACE FUELS AND LUBRICANTS

Using high-quality lubricants and ensuring optimal fuel conditions can have a significant impact on the overall performance of a racing car.

n this module, we will explore the different types of lubricants, their properties and applications, helping you understand how to select the most suitable products to maximise the performance and reliability of your racing car.

9. AERODYNAMICS RACE CAR

When mechanical performance alone is not enough, making the most of the laws of physics becomes essential to improving a racing car's performance. Aerodynamics is one of the key areas that continues to gain importance in motorsport. In this module, you will explore the different aerodynamic components and understand the key parameters that influence their performance.

This module builds on the concepts introduced in the previous aerodynamics module. We will focus on aerodynamic maps (aero maps) and work through a practical calculation example to understand how to achieve optimal aerodynamic balance.

10. POWERTRAIN RACE CAR

Achieving a precise and controlled connection between the engine and the driven wheels is essential for optimal vehicle performance, and this is made possible by the transmission system. In this module, we will explore the different transmission systems and learn how to perform the necessary calculations to achieve optimal gear ratios and maximise the performance of a racing car.

11. MOTORSPORT MATERIALS

A wide range of materials is used to manufacture components in motorsport, and choosing the right material for each application is a crucial decision. In this module, you will explore the properties and characteristics of different materials, understanding their advantages and how they contribute to the performance, efficiency and reliability of racing cars.



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12. ANSYS

- Using Finite Element Analysis (FEA), ANSYS Structural provides a powerful method for predicting the behaviour and performance of complex components made from a wide range of materials.

- The high demands placed on lightweight structural components in racing cars require precise analysis, including accurate geometry definition and meshing, realistic load and stress conditions, and detailed post-processing of simulation results.

- Review the fundamental concepts of fluid mechanics and understand the steps involved in performing fluid flow simulations. Learn how to interpret simulation results, recognise their limitations and become familiar with ANSYS Fluent simulation software.

ANSYS DesignModeler.
ANSYS Meshing.
ANSYS Fluent.
Models & Formulation.
Cell Zones & Boundary Conditions.
Solver Settings.

13. PTC CREO

3D solid modelling using all available tools.

Assemblies, static assemblies and dynamic assemblies; dynamic motion analysis using Pro/Mechanism; structural and thermal simulation.

Surface modelling.

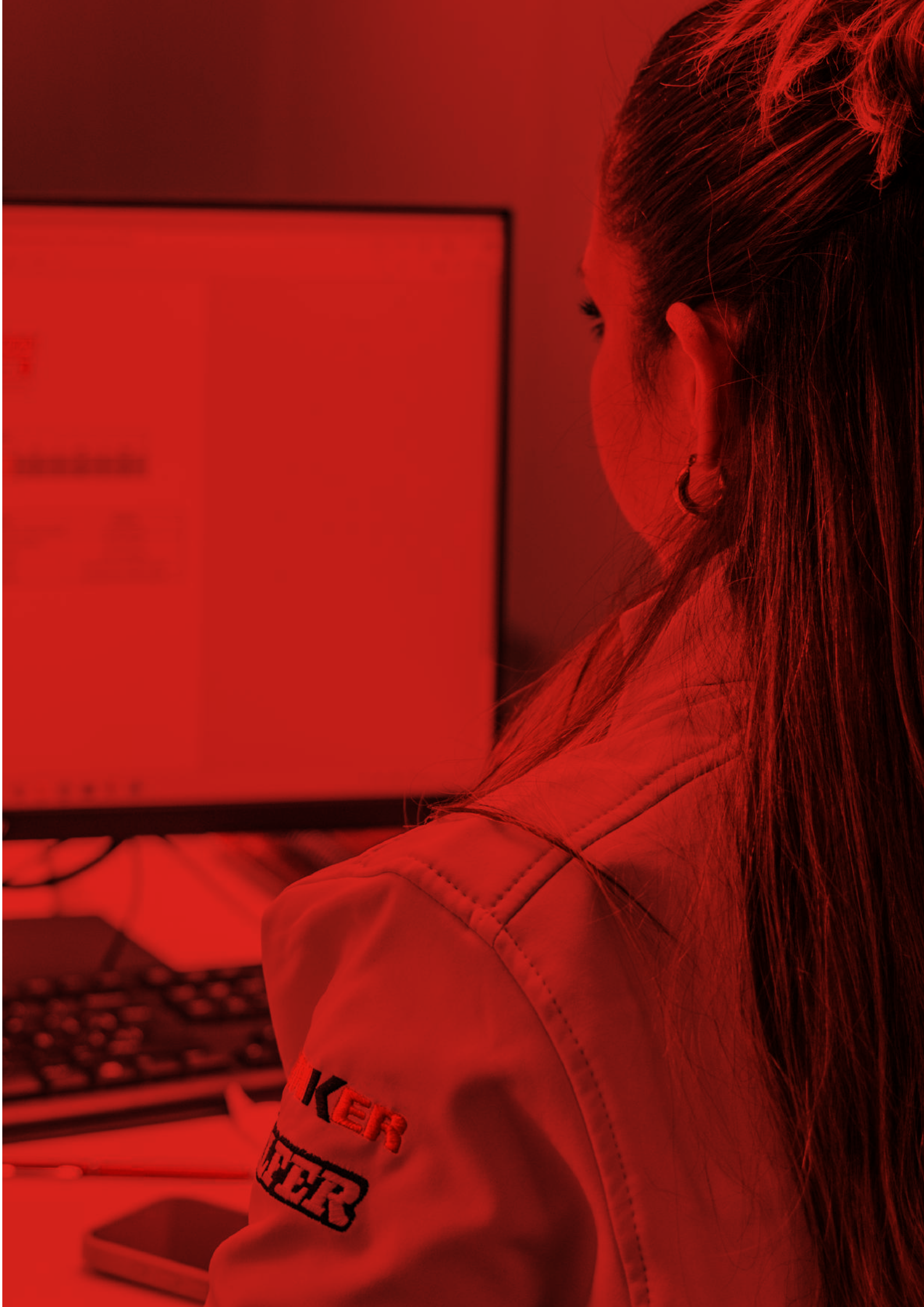
14. MATLAB FUNDAMENTALS & SIMULINK

Understand MATLAB software and its working environment.

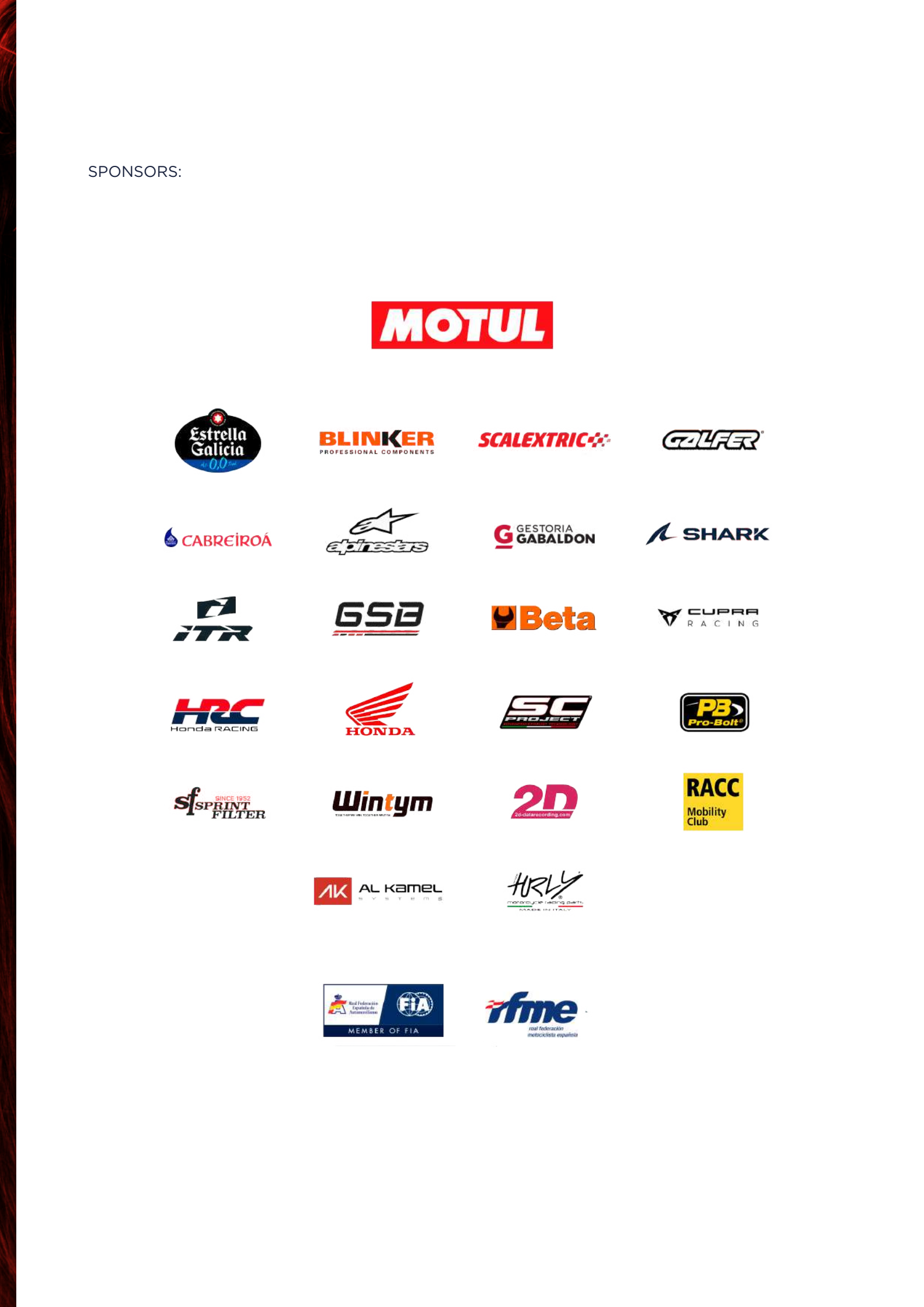
Gain a basic understanding of MATLAB programming, including the use of functions and script files.

- Creation and modification of Simulink models and dynamic system simulation.
- Modelling of continuous-time, discrete-time and hybrid systems.
- Adjustment of solver settings to optimise simulation performance and speed.
- Building a hierarchical structure within a Simulink model.
- Creation of reusable models.





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