Skills required to engineer a race car

A race car is a complex system of interconnected parts working together. Like the car, the team behind it needs to work together to combine skills and knowledge from a range of engineering fields. Here are some of the key skills required:

- **Aerodynamics**
- **Electrical and electronic engineering**
- **Mechanical engineering**
- **Physics**
- **Robotics and mechatronics engineering**
- **Software engineering**
- **Tyres and suspension**
- **Chemistry**
- **Mechanical engineering**
- **Physics**
- **Robotics and mechatronics**
- **Driver ergonomics**
- **Electrical and electronic engineering**
- **Product design engineering**
- **Software engineering**
- **Powertrain**
- **Electrical and electronic engineering**
- **Mechanical engineering**
- **Software engineering**
- **Brakes**
- **Electrical and electronic engineering**
- **Mechanical engineering**
- **Software engineering**
- ** רואה והמשמירה**
- **COMMUNICATION BETWEEN DRIVER AND TEAM**
- **Telecommunications engineering**
- **DATA AQUISITION**
- **Electrical and electronic engineering**
- **Software engineering**
- **ENERGY RECOVERY SYSTEM**
- **Electrical and electronic engineering**
- **Robotics and mechatronics engineering**
- **Software engineering**
- **ELECTRIC BATTERY SYSTEM**
- **Electrical and electronic engineering**
- **Mechanical engineering**
- **Software engineering**
- **RACE STRATEGY, CAR AND RACE MODELLING, SAFETY PLAN**
- **Electrical and electronic engineering**
- **Mechanical engineering**
- **Robotics and mechatronics engineering**
- **Software engineering**
- **Telecommunications engineering**
- **Chassis**
- **Chemistry**
- **Electrical and electronic engineering**
- **Product design engineering**
- **Drivetrain**
- **Electrical and electronic engineering**
- **Mechanical engineering**
- **Robotics and mechatronics engineering**
- **Software engineering**

I joined Team Swinburne because I love motorsports and I want to learn more about the industry. I also enjoy interacting with other team members. I have applied business analysis and project management, problem solving, critical thinking and collaborating in a multi-disciplinary team to a real organisation because Team Swinburne operates as a real business.

I encourage you to join Team Swinburne. It’s a great opportunity to transfer your knowledge and prepare you for the workforce.

JENNIFER
SPONSORSHIP AND ENGAGEMENTS MANAGER, TEAM SWINBURNE

Master of Information Technology - Information Systems Specialisation

ENGINEERING
A CAREER IN THE MOTOR RACING INDUSTRY

swinburne.edu.au/engineering
### WORK ON THE RACE CAR

- Design and build all-wheel-drive hub motors
- Study electrical and electronic engineering
- Study mechanical engineering
- Design and build advanced composite chassis
- Study mechanical engineering
- Study product design engineering
- Design and build high and low voltage systems
- Study electrical and electronic engineering
- Automate car components to reduce human error
- Study robotics and mechatronics engineering
- Study software engineering

- Improve car's performance using data
- Study applied mathematics
- Study data analytics
- Improve cockpit design to enhance driver's performance
- Study industrial design
- Study product design engineering
- Improve fuel efficiency and sustainability
- Study biotechnology
- Study chemistry
- Design battery accumulator
- Study electrical engineering
- Study mechanical engineering
- Study robotics and mechatronics engineering

### Build the Business

- Create games based on racing industry
- Study games and interactivity
- Study games development
- Design merchandise and event program
- Study communication design
- Study graphic design
- Design space for merchandise sales
- Study brand management
- Study visual merchandising
- Design and build website
- Study communication design
- Study software development
- Oversee contract for TV broadcast rights
- Study law

- Coordinate links between international divisions of business
- Study international business
- Promote brand, news and events
- Study marketing
- Study social media
- Ensure security of data from racing teams and/or fans
- Study cybersecurity
- Study network design
- Broadcast the race to global audience
- Study film and television
- Study journalism
- Develop partnerships and networks
- Study entrepreneurship and innovation

### Assist the Driver

- Explore how racing impacts the body
- Study biomedical science
- Monitor driver's mental health
- Study psychology
- Study psychology and psychophysiology
- Explore the impact of driver fatigue on performance
- Study aviation human factors
- Improve driver's health
- Study health across their lifespan
- Study nursing

- Improve driver's performance using data
- Study applied mathematics
- Study data analytics
- Connect driver and pit crew through communications networks
- Study telecommunications engineering
- Create simulators to improve driver training
- Study animation
- Study games development

### Run the Race

- Design and build race track
- Study civil engineering
- Study construction engineering
- Plan, set-up and pack-down event
- Study events
- Study logistics and supply chain management

- Improve car's aerodynamic performance on the track
- Study physics
- Ensure cars and spare parts get where they're needed
- Study logistics and supply chain management

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**Swinburne Study Guide for the Motor Racing Industry**