

Powertrain Engineering

Applied graduate studies



Language:
English

Duration:
16 months



As we stand on the brink of a new era in automotive technology, our electric powertrain specialization prepares you to lead the charge in developing sustainable, high-performance electric vehicles. Join us to be at the forefront of innovation and contribute to a greener future.



IFP School's Master's degree/ Specialized engineering degree (Diplôme d'ingénieur spécialisé)

Electric powertrains are the cornerstone of tomorrow's mobility solutions, offering environmental benefits and driving economic growth through technological advancements. The Powertrain Engineering program is designed to provide comprehensive knowledge and practical skills in the development of advanced electric powertrain systems. This program integrates theoretical learning with hands-on experience to ensure you are industry-ready. Specializing in electric powertrains, you will delve into the intricacies of electric machines, power electronics & control, battery technologies, and vehicle integration, preparing you to address the challenges of modern automotive engineering. You will also study sustainable energy systems including the production of electricity from renewable energy sources and its integration in the distribution network.

As the nature of our studies lies on practical experience, you will engage in hands-on experiments and projects to apply theoretical knowledge, collaborate with industry partners on real-world projects, gaining practical insights and experience. Learning from distinguished experts and industry professionals with extensive experience ensures that the curriculum incorporates the latest innovations and advancements in the field.

CAREER OPPORTUNITIES

Graduates can pursue careers in electric powertrain design, working on cutting-edge projects and innovation or engage in R&D roles focused on improving electric powertrain technologies and developing sustainable solutions through the use of modelling, simulation, testing or calibration. The goal is to ensure the quality and performance of the electric powertrain system and its components. Take the next step towards an exciting career in electric powertrain engineering. Apply now and shape the future of automotive technology.



Find out more: www.ifp-school.com



The program offers a dynamic learning experience, blending innovative teaching methods like virtual reality and flipped classrooms with hands-on activities. You'll engage in practical work at IFPEN's industrial facilities and use the latest software for modelling and simulation. Throughout the program, students will visit industrial sites and work on an exciting year-long e-karting project, applying their knowledge in a real-world context. This comprehensive approach ensures you're well-prepared for the challenges of the electric powertrain industry

Profile/main partner companies

This program is designed for young engineers with a background in electrical, electronic or mechanical engineering. Whether you're passionate about electric vehicles, cutting-edge powertrains, or the future of mobility, this course will give you the specialized skills and knowledge to thrive in the rapidly evolving electric mobility industry. The program is backed by partner companies that play a crucial role in the development of electric technologies and are key contributors to the industry. Some of them are Alstom, Bosch, EDF, Engie, Eurocopter, Forvia, Renault Ampère, Safran, Schneider Electric, Stellantis, TotalEnergies, Valeo, etc.

Program content

The program covers 4 main domains, the concepts and methodologies taught being later applied to a final technical and economic development project, followed by a professional integration period within a company (4 to 6 months).

The program is built around 12 comprehensive teaching units (TUs) that provide a holistic, systems-level understanding of the electric powertrain and its ecosystem, including:

TU1 Fundamentals of electric drives & transportation electrification	TU7 Energy distribution and vehicle infrastructure
TU2 Electricity, power generation, market, legislation and environment	TU8 Design, Diagnostic, Characterisation & Integration of Electric Machines
TU3 Powertrain architectures, integration, and safety	TU9 Design & Integration of Power Electronics
TU4 Electric Machines	TU10 Propulsion, power electronics & electric machine control
TU5 Power Electronics	TU11 Design, durability, manufacturing & valorisation of Batteries
TU6 Batteries	TU12 Data Analysis & IA

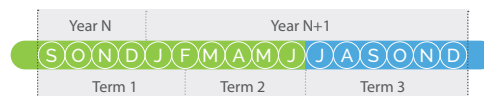


Program schedule

The two examples of schedules shown below correspond to the most frequently encountered cases: a 16-month continuous program for students with a 4- or 5-year degree, and an alternating school/company 16-month program.

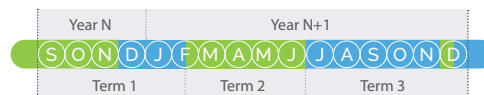
16 months

Continuous program



16 months

Alternating school/company program



Other possible case:

22-month alternating school/company program for students in their penultimate year of a major European school or university having signed a double-degree agreement with IFP School.

22 months

Double-degree



Find out more: www.ifp-school.com



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