

POWERTRAIN ENGINEERING



Sustainable mobility relies on the ability of tomorrow's powertrain engineers to find innovative solutions. Want to help build an environmentally-friendly global automobile industry? Our Powertrain Engineering program offers training suited to this industry's needs and future growth, transforming you into a sought-after Global Powertrain System Engineer who is prepared to become directly operational. This international program will help you build a rewarding career in a multicultural environment. Seize your opportunity!

LES POINTS CLÉS DU CURSUS

**Alternating
school /
company**

**Electrification
and hybridization**

International /

multicultural

LES DÉBOUCHÉS POUR LE PROGRAMME

45%

Automotive
engineering and
R&D companies

25%

Car and truck
manufacturers

25%

Automotive
equipment
suppliers

5%

Energy,
aeronautics,
marine, rail
transport

PROGRAMME & CALENDRIER

Program

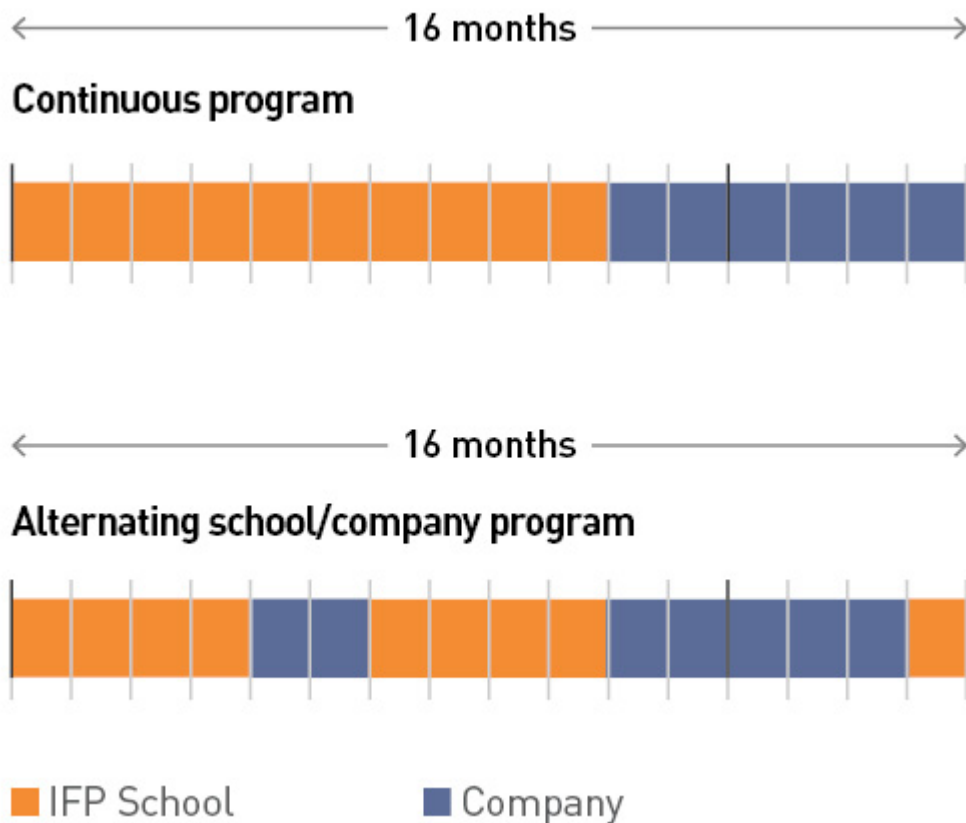
 Introduction to the powertrain

- /// Conventional and advanced combustion in engines
- /// IC engines technologies
- /// Numerical modeling for efficient energy
- /// Energy and environmental issues
- /// Electrified and hybrid vehicles, battery and transmissions
- /// Electric machines and power electronics
- /// Optimal energy management and powertrain control
- /// Powertrain and vehicle testing
- /// In-vehicles integration and final project
- /// Connected and autonomous vehicles
- /// Automotive powertrain market and intercultural management
- /// Complementary technical module
- /// Experience Sharing Module

Planning

The two examples of schedules shown below correspond to the most frequently encountered cases for students in this program:

- /// 16-month continuous program for students with a 4- or 5-year engineering degree
- /// alternating school/company 16-month program for students with a 5-year engineering degree



There are other possible cases, such as:

- /
 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
- /
 18-month alternating school/company program for students holding a BSc in 4 years

OPPORTUNITÉS DE CARRIÈRES

Businesses

The distribution of positions open to graduates of the Powertrain Engineering program is rather consistent. It covers car and truck manufacturers, equipment manufacturers and suppliers, and engineering and R&D companies. Most graduates join technical divisions in these companies, with positions spanning a variety of activities, from functional design to mechanical design, from engine control to development, up to industrial production.

Jobs

Functional design engineer

- /// Synthesis of longitudinal parameters (vehicle performance, consumption, emissions) to define an engine-gearbox pair and the related specifications;
- /// Dimensioning of the air loop and engine charging to achieve the required engine performance (functional specification of the turbocharger, intake divider, valve lift profile, EGR, etc.)

Mechanical design engineer

- /// Mechanical modeling and design using CAD (cylinder head, cylinder block, piston rod, exhaust gas recirculation / EGR valve, injector, transmissions, etc.)
- /// Supplier tracking for the development and standard production of components (piston, air filter, EGR valve, injection pump, turbocharger, actuators, clutch)

Engine control engineer

- /// Development of drive control strategies of a hybrid chain, simulation of strategies on a chain model, rapid prototyping on a test bench or HIL (Hardware In the Loop)
- /// Development of air loop control strategies (low- and high-pressure EGR, turbocharger, etc.)

Development engineer

- /// Driveability calibration (tip in and tip out, gear change, vehicle takeoff , etc.)
- /// Calibration and validation of engine starting in extreme climatic conditions
- /// Calibration of engine control operating strategies (regeneration of particulate filter, idle control, injection pressure, etc.)

FINANCEMENT & SPONSORING

Typical class profile

Students in this program are almost all sponsored by companies (through sponsorships or apprenticeships) that finance their living expenses during the academic period and contribute towards their tuition.

Main sponsors

Among these companies, the following have been IFP School partners in recent years (non-exhaustive list):

- /// OEMs: Ford, Groupe PSA, Groupe Renault, Man, Volvo Powertrain
- /// Engineering and R&D centers: AVL, D2T, IAV, IFP Energies nouvelles
- /// Suppliers: Bosch, Continental, Delphi, Faurecia, Valeo