ELECTRIC VEHICLES AND AUTONOMOUS VEHICLES ADVANCED MASTER®

Pursue a managerial career in the field of electric vehicles, autonomous vehicles and charge infrastructures

The Advanced Master® in Electric Vehicles and Autonomous Vehicles (EV-AV) trains engineers in the technologies needed to design and deploy the vehicles of the future, enabling students to broaden their field of knowledge through a global approach focusing on electrified traction and autonomous vehicles.

In order to prepare future engineers for these imminent challenges, the Groupe Renault Corporate Foundation and the Arts et Métiers ParisTech engineering school are collaborating to offer an innovative, vocationally-oriented technology course in line with the requirements of the automotive sector of tomorrow.

- **Objectives**

Co-accredited by the *Conférence des Grandes Ecoles* and jointly delivered by three top French engineering schools – Arts et Métiers ParisTech, Mines ParisTech, ENSTA ParisTech - the Advanced Master® in Electric Vehicles and Autonomous Vehicles addresses three main fields of study:

- ✓ A global introduction to electrified traction, building on the "Mobility and Electric Vehicles" Master's created in 2010 in partnership between the Renault Foundation and the Arts et Métiers ParisTech engineering school;
- ✓ The questions of storage and charge infrastructures, developed in the Infrastructure and Electric Vehicles Specialized Master® offered by Arts et Métiers ParisTech, introduced in 2015;
- ✓ Enlargement of the scope of study to encompass data science (Big Data), addressing the challenges posed by the autonomous vehicle, destined to disrupt the automotive landscape in the near future.

- **Eligibility**

Applicants shall:

- ✓ Be students or recent graduates of one of partner universities in the following countries: Algeria, Brazil, China, South Korea, France, India, Japan, Lebanon, Morocco, Romania, Russia, Turkey.
- ✓ Hold an engineering degree or an internationally recognized diploma equivalent to a M2 level awarded by a higher education institution.
- ✓ Be able to demonstrate a sufficient command of French (minimum level B2 under the Common European Framework of Reference for languages (CEFR)) and English (TOEIC 750 minimum).
- ✓ Be aged under 35 on September 1 of the year of arrival in France.
- ✓ In cases where skill levels are equivalent, priority will be given to candidates with resource conditions meeting scholarship criteria.

- **Selection**

Selection is a three-stage process:

- ✓ Pre-selection by the Renault Foundation's partners. A code is then sent to the candidates to complete their application online on the Foundation's website;
- ✓ Review of candidates' applications by the partner School and the Renault Foundation;
- ✓ Interview in French to assess the quality and motivation of the candidate.

- **Advantages of the program**

- ✓ Training at the cutting edge of automotive developments, combining the skills of three of the best French engineering "grandes écoles", offering the guarantee of a high level of quality assurance as well as individual progress monitoring for students.
- ✓ Teaching closely linked to the automotive industry and its developments.
- ✓ An international setting.

- **Validation**

75 ECTS credits over 12 months full-time

- **Skills acquired**

This program offers the opportunity to acquire the managerial skills needed to design and deploy the vehicles of the future and their associated charge infrastructure. Its focus is twofold: the vehicle (vehicle electrification, delegated driving and connectivity) and ecomobility (infrastructures and services for new uses).

- **Career prospects**

The Electric Vehicles and Autonomous Vehicles Advanced Master® can lead to career openings in a variety of relevant positions such as design office manager, R&D project leader, research engineer, design engineer, calculation and test engineer, etc.

- **Program languages**

The courses are mainly delivered in French, but some will be in English.

- **Provisional program**

First semester	September	Integrating Foundation		2 weeks
	mid-September to mid-March	**Electrification of vehicles - EV & HEV**	**15 ECTS credits**	150 h
		Power engineering for electric drive chains	3	
		Modeling tools for energy flows in electric drive systems	2	
		Electromechanical conversion: traditional/engine-wheel technologies	4	
		Electrical conversion via power electronics	4	
		Instrumentation and control of electric vehicle drive chains	2	
		Autonomous vehicle (course delivered in English)	**15 ECTS credits**	150 h
		Software and processing platform	2	
		Data science	3	
		Perception for autonomous vehicle	3	
		Location, mapping, planning	2	
		Data fusion for obstacle detection	3	
		Vehicle control systems and modeling	2	
		Infrastructures and shared services for new forms of use	**10 ECTS credits**	100 h
		EV and HEV considered within network environments	3	
		LCA and Well to Wheel	2	
		On-board energy storage	2	
		Smart grids and new types of usage (Smart charging, V2G, V2H, B2B, etc.)	3	
		Mini tutored laboratory project	**5 ECTS credits**	50 h
Second semester	mid-March to mid-September	Industrial internship		6 months

- **Calendar**

Courses are divided between Paris and Lille.

- **Contacts**

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https://www.fondation.renault.com/programmes-dexcellence/ms-ve-va/