SCIENCES, TECHNOLOGIES AND HEALTH

Master in Electronics, electrical energy, automation

Electronique, énergie électrique, automatique

Target level
Baccalaureate +5

ECTS
120 credits

Duration
2 years

Component
Grenoble INP, Institut d'ingénierie et de management - UGA, UFR PhITEM (physique, ingénierie, terre, environnement, mécanique)

Language(s) of instruction
English, French

Subprograms

- Electrical Engineering and Control Systems 1st year
- Design of electrical energy systems (CSEE) 1st and 2nd year
- Microelectronics integration of real-time embedded systems (MISTRE) 1st and 2nd year
- Sciences in electrical engineering for smart grids and buildings (SGB) 1st and 2nd year
- Master in Integration, Security and TRust in Embedded systems 2nd year / MISTRE Valence
- Electrical Engineering and Control Systems / CompSEE 2nd year
- Electrical Engineering and Control Systems / MISCIT 2nd year
- Electrical Engineering and Control Systems / WICS 2nd year

Presentation

The University of Grenoble benefits from an exceptional scientific environment, with a high concentration of laboratories of excellence and industries. Its educational teams, made up of specialised academics and qualified professionals, are among the best in Europe. The establishments (UGA and G-INP) are bolstered by first-rate teaching platforms (GreenER, CIME, Minatec, etc.), enabling students to benefit from leading-edge, professional equipment.

The master in EEA (electronics, electrical energy, automation and signal processing) is an example, offering a comprehensive training course, adapted to the growing need for specialised skills resulting from the constant transformation of energy and information systems. There are therefore numerous career opportunities, with management positions in industry or research & development in both the public and private sectors.

The course is jointly accredited by the Université# Grenoble Alpes and Grenoble INP. The first year prepares students for further studies through a foundation program with two majors (Electrical energy systems and Electronic systems). In the second year of the master, students specialise and choose from among five programs :

- 3MEE (Multiscale and multiphysics modelling for electrical engineering)

- CSEE (Design of electrical energy systems)
- MISCIT (Master in systems, control and information technologies)
- MISTRE (Microelectronics integration of real-time embedded systems)
- WICS (Wireless integrated circuits and systems)

The 3MEE, MISCIT and WICS programs target international students (courses are in English) and concentrate on preparing them for doctoral studies or for positions in industry. The CSEE and MISTRE programs are more vocational, with practical instruction and the option of work-linked training.

The specialisation also includes the two-year master of Science in electrical engineering, which is offered by G-INP.

International education : Internationally-oriented programmes

Admission

Access conditions

- **For the first year** : holders of a bachelor degree in EEA or physics, or equivalent diploma
- **For the second year** : students who have completed the first year of the Master or equivalent level course in the field of electrical energy

Public continuing education : You are in charge of continuing education :

• if you resume your studies after 2 years of interruption of studies

• or if you followed training under the continuous training regime one of the previous 2 years

• or if you are an employee, job seeker, self-employed

If you do not have the diploma required to integrate the training, you can undertake a validation of personal and professional achievements (VAPP)

Candidature / Application

You want to apply and sign up for a master ? Please be aware that the procedure differs depending on the diploma you want to take, the diploma you have already obtained and, for foreign students, your place of residence.Let us be your guide – simply follow this link

Fees

Tuition fees 2023 - 2024: 243 € + 100€ CVEC

And after

Sector(s)

- Business and studies manager
- Specialist in the design of devices and systems
- Responsible in research and development, production, quality control
- Teacher / researcher

Additional information

Useful info

Contacts

Program director

Julien Pernot

julien.Pernot@univ-grenoble-alpes.fr

Program administration

Registrar's Office for the Master in Electronics, electrical energy, automation

phitem.master.eea@univ-grenoble-alpes.fr

Program administration

Application

phitem.candidature.etudiant@univ-grenoble-alpes.fr

Continuing education manager

Contact FC STS

fc-sts@univ-grenoble-alpes.fr

Course location(s) - City

Grenoble

Campus

Grenoble - Scientific Polygon

Program

Electrical Engineering and Control Systems 1st year

Master 1st year

Semester 7

	Nature	CM	TD	TP	Crédits
UE Signals and systems	Teaching Unit (UE)	7,5h	7,5h	12h	3 credits
UE High frequency electronics	Teaching Unit (UE)		7,5h	9h	3 credits
UE Linear dynamical system	Teaching Unit (UE)				3 credits
UE State space representation	Teaching Unit (UE)		9h	4h	3 credits
UE Scientific programming in Python	Teaching Unit (UE)			16h	3 credits
UE Numerical methods	Teaching Unit (UE)			12h	3 credits
UE Analog and digital transmission	Teaching Unit (UE)		7h	12h	3 credits
English	Teaching Unit (UE)			24h	3 credits
French as a foreign language	Teaching Unit (UE)				3 credits
UE Linear optimal control	Teaching Unit (UE)			12h	3 credits
UE Numerical analysis of circuits equations	Teaching Unit (UE)				3 credits
UE Analog electronics	Teaching Unit (UE)	8h		8h	3 credits

Semester 8

	Nature	CM	TD	TP	Crédits

UE SISO Feedback control	Teaching Unit (UE)	15h	9h	15h	3 credits
UE Initiation to research methodologies	Teaching Unit (UE)			35h	6 credits
UE Embedded systems and internet of things (IOT)	Teaching Unit (UE)			18h	3 credits
UE Electromagnetism	Teaching Unit (UE)		10h		3 credits
UE Introduction to numerical field computation	Teaching Unit (UE)			12h	3 credits
UE Communication systems	Teaching Unit (UE)			8h	3 credits
UE Introduction to RF electronic design	Teaching Unit (UE)		2h	20h	3 credits
UE Internship	Teaching Unit (UE)				6 credits

Design of electrical energy systems (CSEE) 1st and 2nd year

Microelectronics integration of real-time embedded systems (MISTRE) 1st and 2nd year

Sciences in electrical engineering for smart grids and buildings (SGB) 1st and 2nd year

Master in Integration, Security and TRust in Embedded systems 2nd year / MISTRE Valence

Electrical Engineering and Control Systems / CompSEE 2nd year

Master 2nd year

Semester 9

	Nature	CM	TD	TP	Crédits
UE Power Systems Modeling and Analysis I	Teaching Unit (UE)	10h		40h	3 credits
UE Power Systems Modeling and Analysis II	Teaching Unit (UE)	10h		40h	3 credits
UE Optimization of Energy Systems	Teaching Unit (UE)	8h	12h		3 credits
UE Modeling and Methods for Electrical Circuits and Systems	Teaching Unit (UE)	6h		14h	3 credits
UE Optimization Methods for Components and Systems	Teaching Unit (UE)				3 credits
UE Theory and Computation of Electromagnetic Fields	Teaching Unit (UE)			15h	6 credits
UE Advanced techniques for computational electromagnetics	Teaching Unit (UE)				6 credits
UE Research Project	Teaching Unit (UE)				3 credits

Semester 10

	Nature	CM	TD	TP	Crédits
UE Humanities and engineering	Teaching Unit (UE)			10h	3 credits
UE Internship Master CompSEE	Teaching Unit (UE)				24 credits
UE English or French as a foreign language	Teaching Unit (UE)				3 credits

Electrical Engineering and Control Systems / MISCIT 2nd year

Master 2nd year

Semester 9 OPTION IPA

	Nature	CM	TD	TP	Crédits
UE Multi-objective control	Teaching Unit (UE)	41h		31h	6 credits

UE Modeling and system identification	Teaching Unit (UE)	24h			3 credits
UE Adaptive control systems	Teaching Unit (UE)	18h		12h	3 credits
UE Embedded control and modeling labs	Teaching Unit (UE)	9h		36h	3 credits
UE Supervision and diagnosis	Teaching Unit (UE)	15h	15h		3 credits
UE Network applications	Teaching Unit (UE)	31,5h		22h	6 credits
UE Design project 1	Teaching Unit (UE)			23h	3 credits
UE English	Teaching Unit (UE)		24h		3 credits
UE French as a foreign language	Teaching Unit (UE)				3 credits

Semester 9 OPTION CST

	Nature	CM	TD	TP	Crédits
UE Multi-objective control	Teaching Unit (UE)	41h		31h	6 credits
UE Modeling and system identification	Teaching Unit (UE)	24h			3 credits
UE Adaptive control systems	Teaching Unit (UE)	18h		12h	3 credits
UE Nonlinear and predictive control	Teaching Unit (UE)	34h			6 credits
UE Design project 1	Teaching Unit (UE)			23h	3 credits
UE Efficient methods in optimization	Teaching Unit (UE)	27h			3 credits
UE Modeling and control of PDE	Teaching Unit (UE)	42h			6 credits
UE Embedded control and modeling labs	Teaching Unit (UE)	9h		36h	3 credits
UE Supervision and diagnosis	Teaching Unit (UE)	15h	15h		3 credits

French as a foreign language	Teaching Unit (UE)				3 credits
UE English	Teaching Unit (UE)		24h		3 credits

Semester 10 OPTION IPA

	Nature	CM	TD	TP	Crédits
UE Project management and seminars	Teaching Unit (UE)	25,5h	60h		3 credits
UE Internship	Teaching Unit (UE)				24 credits
UE Systems Reliability and Maintenance	Teaching Unit (UE)			6h	3 credits

Semester 10 OPTION CST

	Nature	CM	TD	TP	Crédits
UE Project management and seminars	Teaching Unit (UE)	25,5h	60h		3 credits
UE Internship	Teaching Unit (UE)				24 credits
UE reinforcement learning and optimal control	Teaching Unit (UE)	32h			3 credits

Electrical Engineering and Control Systems / WICS 2nd year

Master 2nd year

Semester 9

	Nature	CM	TD	TP	Crédits
UE Radiofrequency Communication Systems	Teaching Unit (UE)	14h			6 credits
UE Radiofrequency Integrated Circuits	Teaching Unit (UE)	14h	14h	24h	6 credits
UE Microwave Circuits	Teaching Unit (UE)			24h	6 credits

UE Antennas and Electromagnetic Compatibility	Teaching Unit (UE)	16h	10h		3 credits
UE Integrated technologies & process of fabrication	Teaching Unit (UE)			8h	3 credits
UE Research lab work (part I)	Teaching Unit (UE)				3 credits
UE Specialty courses	Teaching Unit (UE)				3 credits

Semester 10

	Nature	CM	TD	TP	Crédits
UE Research internship	Teaching Unit (UE)				24 credits
UE Research lab work (part II)	Teaching Unit (UE)				3 credits
UE French as a foreign language	Teaching Unit (UE)				3 credits
UE English	Teaching Unit (UE)				3 credits