

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

- > Multiscale and mutliphysics modeling for electrical engineering (3MEE)
- > Design of electrical energy systems (CSEE)
- > Master in systems, control and information technologies (MISCIT)
- > Wireless integrated circuits and systems (WICS)
- > Sciences in electrical engineering for smart grids and buildings (SGB)
- > Microelectronics integration of real-time embedded systems (MISTRE)



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, Minattec, 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 :  <https://www.univ-grenoble-alpes.fr/candidater-et-s-inscrire/>

Fees

Tuition fees 2019-2020: 243 €

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

Course location(s) - City

📍 Grenoble

Campus

🏠 Grenoble - Scientific Polygon

Program

Multiscale and mutliphysics modeling for electrical engineering (3MEE)

Master in Electrical energy systems (SEE) 1st year

Semester 7

	Nature	CM	TD	TP	Crédits
UE State-space representation	Teaching Unit (UE)	15h	9h	4h	3 credits
UE Entrepreneurial project management	Teaching Unit (UE)		25h		3 credits
UE Automata and embedded systems	Teaching Unit (UE)			35h	6 credits
UE Power networks	Teaching Unit (UE)	15h	10,5h	8h	3 credits
UE Electrical machines	Teaching Unit (UE)	15h	10,5h	8h	3 credits
UE Summary of converters	Teaching Unit (UE)	15h	9h		3 credits
UE Structures of converters	Teaching Unit (UE)	15h	10,5h	8h	3 credits
UE Passive components	Teaching Unit (UE)	15h	6h	4h	3 credits
UE SEE project part 1	Teaching Unit (UE)	6h			3 credits

Semester 8

	Nature	CM	TD	TP	Crédits
UE SISO Feedback control	Teaching Unit (UE)	15h	9h	15h	3 credits
UE Electromagnetic compatibility	Teaching Unit (UE)	15h	15h		3 credits
UE Internship	Teaching Unit (UE)				6 credits

UE Speed variation	Teaching Unit (UE)	9h	9h	8h	3 credits
UE Modelling of power systems	Teaching Unit (UE)	12h	6h	8h	3 credits
UE Advanced power electronics	Teaching Unit (UE)	11h	10h	18,5h	3 credits
UE SEE project part 2	Teaching Unit (UE)	6h			3 credits
UE SEE project part 3	Teaching Unit (UE)	6h			3 credits
UE Transverse teaching of choice	SUBJECT				
UE English	Teaching Unit (UE)				3 credits

Master 2nd year

Semester 9

	Nature	CM	TD	TP	Crédits
UE Dynamic modeling and analysis of electrical systems	Teaching Unit (UE)				6 credits
UE Circuit analysis	Teaching Unit (UE)				3 credits
UE Theory and techniques for computational electromagnetics	Teaching Unit (UE)				6 credits
UE Advanced techniques for computational electromagnetics	Teaching Unit (UE)				6 credits
UE Advanced topological methods for power systems	Teaching Unit (UE)				6 credits
UE Research project	Teaching Unit (UE)				3 credits

Semester 10

	Nature	CM	TD	TP	Crédits
UE Public speaking or french as a foreign language	Teaching Unit (UE)				3 credits
UE Internship	Teaching Unit (UE)				24 credits

Design of electrical energy systems (CSEE)

Master in systems, control and information technologies (MISCIT)

Master in Electrical energy systems (SEE) 1st year

Semester 7

	Nature	CM	TD	TP	Crédits
UE State-space representation	Teaching Unit (UE)	15h	9h	4h	3 credits
UE Entrepreneurial project management	Teaching Unit (UE)		25h		3 credits
UE Automata and embedded systems	Teaching Unit (UE)			35h	6 credits
UE Power networks	Teaching Unit (UE)	15h	10,5h	8h	3 credits
UE Electrical machines	Teaching Unit (UE)	15h	10,5h	8h	3 credits
UE Summary of converters	Teaching Unit (UE)	15h	9h		3 credits
UE Structures of converters	Teaching Unit (UE)	15h	10,5h	8h	3 credits
UE Passive components	Teaching Unit (UE)	15h	6h	4h	3 credits
UE SEE project part 1	Teaching Unit (UE)	6h			3 credits

Semester 8

	Nature	CM	TD	TP	Crédits
UE SISO Feedback control	Teaching Unit (UE)	15h	9h	15h	3 credits

UE Electromagnetic compatibility	Teaching Unit (UE)	15h	15h		3 credits
UE Internship	Teaching Unit (UE)				6 credits
UE Speed variation	Teaching Unit (UE)	9h	9h	8h	3 credits
UE Modelling of power systems	Teaching Unit (UE)	12h	6h	8h	3 credits
UE Advanced power electronics	Teaching Unit (UE)	11h	10h	18,5h	3 credits
UE SEE project part 2	Teaching Unit (UE)	6h			3 credits
UE SEE project part 3	Teaching Unit (UE)	6h			3 credits
UE English	Teaching Unit (UE)				3 credits
UE Transverse teaching of choice	SUBJECT				

Master Electrical systems (SE) 1st year

Semester 7

	Nature	CM	TD	TP	Crédits
UE State-space representation	Teaching Unit (UE)	15h	9h	4h	3 credits
UE Entrepreneurial project management	Teaching Unit (UE)		25h		3 credits
UE Automata and embedded systems	Teaching Unit (UE)			35h	6 credits
UE Advanced random signal processing	Teaching Unit (UE)	7,5h	9h	8h	3 credits
UE Radiofrequency electronics	Teaching Unit (UE)	7,5h	7,5h	9h	3 credits
UE Analog and digital transmission systems	Teaching Unit (UE)	11h	7h	12h	3 credits
UE SE project part 1	Teaching Unit (UE)	9h			3 credits

UE SE project part 2	Teaching Unit (UE)		3 credits
UE Operating systems (C,C++)	Teaching Unit (UE)	18h	3 credits

Semester 8

	Nature	CM	TD	TP	Crédits
UE SISO Feedback control	Teaching Unit (UE)	15h	9h	15h	3 credits
UE Electromagnetic compatibility	Teaching Unit (UE)	15h	15h		3 credits
UE Internship	Teaching Unit (UE)				6 credits
UE Antennas	Teaching Unit (UE)	7,5h	7,5h	9h	3 credits
UE Real-time operating systems (OS, RTOS)	Teaching Unit (UE)			18h	3 credits
UE Design in micro-nano electronics	Teaching Unit (UE)	12h	4h	9h	3 credits
UE SE project part 3	Teaching Unit (UE)				3 credits
UE Coding and information theory	Teaching Unit (UE)	10,5h	9h	8h	3 credits
UE English	Teaching Unit (UE)				3 credits
UE Transverse teaching of choice	SUBJECT				

Master 2nd year

Semester 9 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 Discrete event systems	Teaching Unit (UE)	15h		6h	3 credits

UE Modeling and control of PDE	Teaching Unit (UE)	42h		6 credits
UE Nonlinear and predictive control	Teaching Unit (UE)	34h		6 credits
UE Design project 1	Teaching Unit (UE)			3 credits
UE Efficient methods in optimization	Teaching Unit (UE)	27h		3 credits
UE English	Teaching Unit (UE)		30h	3 credits
UE French as a foreign language	Teaching Unit (UE)			3 credits

Semester 9 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 Discrete event systems	Teaching Unit (UE)	15h		6h	3 credits
UE Embedded control and modeling labs	Teaching Unit (UE)	9h		36h	3 credits
UE Communication systems	Teaching Unit (UE)	18h		16h	3 credits
UE Supervision and diagnosis	Teaching Unit (UE)	15h	15h		3 credits
UE Network applications	Teaching Unit (UE)	42h		29h	6 credits
UE French as a foreign language	Teaching Unit (UE)				3 credits
UE English	Teaching Unit (UE)			30h	3 credits

Semester 10 CST

	Nature	CM	TD	TP	Crédits
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UE Project management and seminars	Teaching Unit (UE)	25,5h	42h	3 credits
UE Internship	Teaching Unit (UE)			24 credits
UE Design project 1	Teaching Unit (UE)			3 credits

Semester 10 IPA

	Nature	CM	TD	TP	Crédits
UE Introduction to data assimilation	Teaching Unit (UE)	32h			3 credits
UE Project management and seminars	Teaching Unit (UE)	25,5h	42h		3 credits
UE Internship	Teaching Unit (UE)				24 credits

Wireless integrated circuits and systems (WICS)

Master in Electronic Systems (SE) 1st year

Semestre 7

	Nature	CM	TD	TP	Crédits
UE State-space representation	Teaching Unit (UE)	15h	9h	4h	3 credits
UE Entrepreneurial project management	Teaching Unit (UE)		25h		3 credits
UE Automata and embedded systems	Teaching Unit (UE)			35h	6 credits
UE Advanced random signal processing	Teaching Unit (UE)	7,5h	9h	8h	3 credits
UE Radiofrequency electronics	Teaching Unit (UE)	7,5h	7,5h	9h	3 credits
UE Analog and digital transmission systems	Teaching Unit (UE)	11h	7h	12h	3 credits
UE SE project part 1	Teaching Unit (UE)	9h			3 credits

UE SE project part 2	Teaching Unit (UE)		3 credits
UE Operating systems (C,C++)	Teaching Unit (UE)	18h	3 credits

Semester 8

	Nature	CM	TD	TP	Crédits
UE SISO Feedback control	Teaching Unit (UE)	15h	9h	15h	3 credits
UE Electromagnetic compatibility	Teaching Unit (UE)	15h	15h		3 credits
UE Internship	Teaching Unit (UE)				6 credits
UE Antennas	Teaching Unit (UE)	7,5h	7,5h	9h	3 credits
UE Real-time operating systems (OS, RTOS)	Teaching Unit (UE)			18h	3 credits
UE Design in micro-nano electronics	Teaching Unit (UE)	12h	4h	9h	3 credits
UE SE project part 3	Teaching Unit (UE)				3 credits
UE Coding and information theory	Teaching Unit (UE)	10,5h	9h	8h	3 credits
UE English	Teaching Unit (UE)				3 credits
UE Transverse teaching of choice	SUBJECT				

Master 2nd year

Semester 9

	Nature	CM	TD	TP	Crédits
UE Radiofrequency Communication Systems	Teaching Unit (UE)			16h	6 credits
UE Radiofrequency Integrated Circuits	Teaching Unit (UE)			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 Specialty courses	Teaching Unit (UE)			3 credits
UE Research lab work	Teaching Unit (UE)			3 credits

Semestrer 10

	Nature	CM	TD	TP	Crédits
UE Research internship	Teaching Unit (UE)				24 credits
UE Research lab work	Teaching Unit (UE)				3 credits
UE French as a foreign language	Teaching Unit (UE)				3 credits
UE English	Teaching Unit (UE)			30h	3 credits

Sciences in electrical engineering for smart grids and buildings (SGB)

Microelectronics integration of real-time embedded systems (MISTRE)