

## Studies Plan

### Génie électrique et électronique 2024-25

#### Block 2 : Labs and projects

Courses			Master 1	Master 2	Exam Session	Exam	Credit			
Language	Code	Section	Teacher	Specialization	o p	l e p				
E	<b>Innovation &amp; entrepreneurship in engineering</b> MGT-555		MTE	Michaud Weber	2h	8h	Win	During the semester	10	
E	<b>Lab in acoustics</b> EE-490(a)		EL	Lissek		4h	Win	During the semester	4	
E	<b>Lab in advanced VLSI design</b> EE-490(b)		EL	Burg Levisse			4h	Sum	During the semester	4
E	<b>Lab in electrical energy systems</b> EE-490(c)		EL	Dujic		4h	Win	During the semester	4	
E	<b>Lab in microwaves</b> EE-490(e)		EL	Skrivervik		4h	Win	During the semester	4	
E	<b>Lab in nanoelectronics</b> EE-490(i)		EL	Kis		4h	Win	During the semester	4	
E	<b>Lab in signal and image processing</b> EE-490(f)		EL	Thiran			4h	Sum	During the semester	4
E	<b>Lab on app development for tablets and smartphones</b> EE-490(g)		EL	Ansaloni		4h	Win	During the semester	4	
E	<b>Lab on cell-free synthetic biology</b> EE-490(j)		EL	Maerkl		4h	Win	During the semester	4	
E	<b>Project in AI and machine learning</b> EE-492(k)		EL	Profs divers		10h	10h	Sum Win	During the semester	10
E	<b>Project in edge computing and IoT</b> EE-492(j)		EL	Profs divers		10h	10h	Sum Win	During the semester	10
E	<b>Project in energy science and technology</b> EE-492(z)		EL	Profs divers		10h	10h	Sum Win	During the semester	10
E	<b>Project in information technologies and signal processing</b> EE-492(l)		EL	Profs divers		10h	10h	Sum Win	During the semester	10
E	<b>Project in microelectronics</b> EE-492(a)		EL	Profs divers		10h	10h	Sum Win	During the semester	10
E	<b>Project in nano and optoelectronics</b> EE-492(i)		EL	Profs divers		10h	10h	Sum Win	During the semester	10
	<b>HSS : Introduction to project</b> SHS							Win		3
	<b>HSS : Project</b> SHS							Sum		3

#### Group "options"

Courses			Master 1	Master 2	Exam Session	Exam	Credit				
Language	Code	Section	Teacher	Specialization	o p	l e p					
E	EE-524	EL	Choo		1h	2h		Win	Written	3	
E	<b>Adaptation and learning</b> EE-566		EL	Sayed			2h	2h	Sum	Written	4
E	<b>Advanced analog integrated circuit design</b> EE-523		EL	Shoaran			2h	1h	Sum	Written	3

E	<b>Advanced computer architecture</b>									
	CS-470	IN	lenne	3h	2h	Sum	Written	8		
E	<b>Advanced lab in electrical energy systems</b>									
	EE-588	EL	Hodder Robert		4h	Sum	During the semester	4		
E	<b>Advanced lab in electrical engineering</b>									
	EE-598	EL		4h	4h	Sum Win	During the semester	4		
E	<b>Advanced multiprocessor architecture</b>									
	CS-471	IN	Falsafi	4h	8h	Win	During the semester	8		
E	<b>Analog circuits for biochip</b>									
	EE-518	EL	Carrara Schmid Skrivervik	2h	1h	Sum	Written	3		
E	<b>Applied biomedical signal processing</b>									
	EE-512	EL	Lemay	2h	2h	Win	Written	4		
E	<b>Applied data analysis</b>									
	CS-401	SC	Brbic	2h	2h	Win	Written	8		
E	<b>Audio engineering</b>									
	EE-548	EL	Lissek	2h	2h	Win	Written	4		
E	<b>Automatic speech processing</b>									
	EE-554	EL	Magimai Doss	2h	2h	Win	Written	4		
E	<b>Basics in bioinstrumentation</b>									
	BIOENG-421	SV	Merten	1h	1h	2h	Win	During the semester	4	
E	<b>Bioelectronics and biomedical microelectronics</b>									
	EE-519	EL	Schmid	2h	1h	Win	Written	3		
E	<b>Bio-nano-chip design</b>									
	EE-517	EL	Carrara	2h	2h	Win	Written	4		
E	<b>Causal inference</b>									
	MGT-416	MTE	Kiyavash	2h	1h	Sum	During the semester	4		
E	<b>Classical and quantum photonic transducers</b>									
	MICRO-410	MT		2h	1h	Sum	Oral	3		
E	<b>Computational neurosciences: neuronal dynamics</b>									
	NX-465	NX	Gerstner	2h	2h	Sum	Written	5		
E	<b>Computational optical imaging</b>									
	MICRO-421	MT	Psaltis	2h	1h	Sum	During the semester	3		
E	<b>Concurrent engineering of space missions</b>									
	ENG-411	EL	Kneib	1h	3h	Sum	Oral	2		
E	<b>Data visualization</b>									
	COM-480	SC	Vuillon	2h	2h	Sum	During the semester	6		
E	<b>Deep learning</b>									
	EE-559	EL	Cavallaro	2h	2h	Sum	During the semester	4		
E	<b>Deep learning for autonomous vehicles</b>									
	CIVIL-459	GC	Alahi	2h	4h	Sum	During the semester	6		
E	<b>Deep learning for optical imaging</b>									
	MICRO-573	MT	Psaltis	2h	1h	Sum	During the semester	3		
E	<b>Design technologies for integrated systems</b>									
	CS-472	IN	De Micheli	3h	2h	Win	During the semester	6		
E	<b>Discrete optimization</b>									
	MATH-261	MA	Eisenbrand	2h	2h	Sum	Written	5		
E	<b>Distributed information systems</b>									
	CS-423	SC	Aberer	2h	1h	1h	Win	Written	6	
E	<b>Distributed intelligent systems</b>									
	ENG-466	SIE	Martinoli	2h	1h	Win	Oral	5		
E	<b>Electromagnetic compatibility</b>									
	EE-576	EL	Rachidi-Haeri	3h	1h	Sum	During the semester	4		
E	<b>Embedded system design</b>									
	CS-476	IN	Kluter	2h	2h	Sum	During the semester	6		

E	<b>Energy conversion and renewable energy</b> ME-409	GM	Maréchal Nguyen	2h 1h 1h		Win	Written	4
E	<b>Energy storage in power systems: technologies, applications and future needs</b> EE-466	EL	Sossan	2h 1h		Win	Written	3
E	<b>Energy systems engineering</b> ChE-304	CGC	Luterbacher		2h 1h	Sum	During the semester	3
E	<b>Fundamentals &amp; processes for photovoltaic devices</b> MICRO-565	MT	Ballif		2h 1h	Sum	Written	3
E	<b>Fundamentals of biomedical imaging</b> PHYS-438	PH	Gruetter		2h 2h	Sum	Written	4
E	<b>Fundamentals of biosensors and electronic biochips</b> EE-515	EL	Guiducci	2h 1h		Win	Written	3
E	<b>Fundamentals of VLSI design</b> EE-429	EL	Burg Levisse	3h 1h 2h		Win	Written	6
E	<b>How to design for value for space applications</b> EE-522	EL	Ben Hamida		2h 1h	Sum	During the semester	2
E	<b>Hydropower plants: generating and pumping units</b> EE-456	EL	Vagnoni	1h 1h		Win	Written	2
E	<b>Image analysis and pattern recognition</b> EE-451	EL	Bozorgtabar Thiran		2h 2h	Sum	During the semester	4
E	<b>Image and video coding</b> EE-569	EL	Ebrahimi	3h 1h		Win	Oral	4
E	<b>Industrial automation</b> CS-487	SC	Sommer Tournier		2h 1h	Sum	Oral	3
E	<b>Industrial electronics I</b> EE-465	EL	Dujic	2h 2h		Win	Oral	4
E	<b>Industrial electronics II</b> EE-565	EL	Dujic		2h 2h	Sum	Oral	4
E	<b>Information theory and coding</b> COM-404	SC	Telatar	4h 2h		Win	Written	8
E	<b>Introduction to bioengineering</b> EE-526	EL	Maerkl		2h 1h	Sum	Written	3
E	<b>Introduction to quantum science and technology</b> QUANT-400	SIQ	Carleo Charbon Ionescu Macris Scarlino	3h 1h		Win	Written	5
E	<b>Introduction to the design of space mechanisms</b> EE-580	EL	Feusier		2h	Sum	Oral	2
E	<b>Large-scale data science for real-world data</b> COM-490	SC	Bouillet Delgado Sarni Verscheure		4h	Sum	During the semester	6
E	<b>Lasers: theory and modern applications</b> MICRO-422	MT	Kippenberg Moser	3h 1h		Win	Written	4
E	<b>Lessons learned from the space exploration</b> EE-582	EL	Toussaint		2h	Sum	During the semester	2
E	<b>Life cycle assessment in energy systems</b> ENV-510	EL	Margni	2h 1h		Win	Written	3
E	<b>Lifecycle performance of product systems</b> ME-516	GM	Friot		2h 1h	Sum	During the semester	3
E	<b>Machine learning</b> CS-433	IN	Flammarion Jaggi	4h 2h 2h		Win	Written	8
E	<b>Machine learning I</b> MICRO-455	MT	Billard	4h		Win	Written	4
	<b>Mathematics of data: from theory to</b>							

E	<b>computation</b> EE-556	EL	Cevher	3h	3h		Win	Written	6	
E	<b>Media security</b> EE-552	EL	Ebrahimi		2h	1h	Sum	Written	6	
E	<b>Microwaves, the basics of wireless communications</b> EE-445	EL	Skrivervik	2h	2h		Win	During the semester	4	
E	<b>Mobile networks</b> COM-405	SC	Al Hassanieh	3h	2h	2h	Win	Written	8	
E	<b>Model predictive control</b> ME-425	GM	Jones	2h	2h		Win	Written	4	
E	<b>Multivariable control</b> ME-422	GM	Ferrari Trecate	2h	2h		Win	Written	4	
E	<b>Nanoelectronics</b> EE-535	EL	Ionescu	2h			Win	Written	2	
E	<b>Nanophotonics</b> MICRO-516	MT	Iadanza Moselund		2h	1h	Sum	Oral	3	
E	<b>Networked control systems</b> ME-427	GM	Ferrari Trecate	2h	1h		Win	Written	3	
E	<b>Network machine learning</b> EE-452	EL	Frossard Thanou		2h	2h	Sum	During the semester	4	
E	<b>Neural interfaces</b> NX-422	NX	Lacour Shoaran	4h	2h		Win	During the semester	6	
E	<b>Optical detectors</b> MICRO-523	MT	Bruschini	2h	1h		Win	Oral	3	
E	<b>Optimal decision making</b> MGT-483	MTE	Kuhn		2h	2h	Sum	Written	4	
E	<b>Photonic systems and technology</b> EE-440	EL	Brès		2h	2h	Sum	Written	4	
E	<b>Physical models for micro and nanosystems</b> EE-536	EL	Kis	2h			Win	During the semester	2	
E	<b>Physics of photonic semiconductor devices</b> PHYS-434	PH	Butté		2h	2h	Sum	Written	4	
E	<b>Power system restructuring and deregulation</b> EE-570	EL	Cherkaoui		2h	1h	Sum	During the semester	3	
E	<b>Project in electrical engineering</b> EE-491	EL	Profs divers		10h	10h	Sum Win	During the semester	10	
E	<b>Radio frequency circuits design techniques</b> EE-426	EL	Ruffieux	2h	2h		Win	Written	4	
E	<b>Reinforcement learning</b> EE-568	EL	Cevher		2h	2h	2h	Sum	During the semester	6
E	<b>Research project in electrical engineering</b> EE-573	EL	Profs divers		22h		Win	During the semester	22	
E	<b>Selected topics in advanced optics</b> MICRO-420	MT	Martin	3h			Win	Oral	3	
E	<b>Semiconductor devices II</b> EE-567	EL	Ionescu Kis		2h	2h	Sum	During the semester	4	
E	<b>Semiconductor physics and light-matter interaction</b> PHYS-433	PH	Butté	2h	2h		Win	Written	4	
E	<b>Seminar in physiology and instrumentation</b> MICRO-568	MT	Radenovic	2h			Win	Written	2	
E	<b>Sensors in medical instrumentation</b> EE-511	EL	Chételat Ionescu		2h	1h	Sum	Written	3	
E	<b>Smart sensors for IoT</b> EE-594	EL		2h	1h		Win	Written	3	
E	<b>Spacecraft design and system engineering</b> EE-584	EL	David Udriot	2h	2h		Win	During the semester	5	

E	<b>Space mission design and operations</b> EE-585	EL	Kuntzer	2h		Win	Oral	2	
E	<b>Space propulsion</b> ENG-510	EL	Jäger	2h	1h	Sum	Oral	3	
E	<b>Space sustainability, a multidisciplinary approach</b> EE-587	EL	David Udriot	1h	1h	Sum	Oral	2	
E	<b>Statistics for data science</b> MATH-413	MA	Chandak Limnios	4h	2h	Sum	Written	8	
E	<b>Sustainability and materials</b> MSE-341	MX	Abitbol	2h	1h	Sum	During the semester	3	
E	<b>Sustainability assessment of urban systems</b> ENV-461	SIE	Binder Heinrich	2h	1h	Sum	During the semester	3	
E	<b>System programming for Systems-on-chip</b> CS-473	IN	Kluter	2h	2h	Win	During the semester	6	
E	<b>Systems and architectures for signal processing</b> EE-555	EL	Mattavelli	2h	1h	Win	Oral	3	
E	<b>TCP/IP networking</b> COM-407	SC	Nikolopoulos	2h	2h	2h	Win	Written	8
E	<b>Test of VLSI systems</b> EE-530	EL	Schmid	2h		Win	Written	2	
E	<b>Transdisciplinary project</b> EE-493	EL	Profs divers		4h	Sum	During the semester	4	

#### Group 1

Courses			Master 1	Master 2	Exam Session	Exam	Credit			
Language	Code	Section	Teacher	Specialization	p	l	e	p		
E	<b>Convex optimization</b> MGT-418	MTE	Kuhn	2h	2h	Win	Written	5		
E	<b>Fundamentals of analog VLSI design</b> EE-424	EL	Choo Enz	2h	2h	Win	Written	4		
E	<b>Fundamentals of inference and learning</b> EE-411	EL	Krzakala	2h	2h	Win	During the semester	4		
E	<b>Semiconductor devices I</b> EE-557	EL	Matioli	3h	1h	Win	During the semester	4		
E	<b>Smart grids technologies</b> EE-472	EL	Paolone		2h	1h	2h	Sum	Written	5
E	<b>Wireless receivers: algorithms and architectures</b> EE-442	EL	Burg	2h	2h	Win	During the semester	4		

#### Internship

Courses			Master 1	Master 2	Exam Session	Exam	Credit		
Language	Code	Section	Teacher	Specialization	p	l	e	p	
F	<b>Engineering internship (master in Electrical and Electronical engineering)</b> EE-596(a)	EL	Profs divers		680h	680h	Sum Win	During the semester	30

#### Master project

Courses			Master 1	Master 2	MP Autumn	MP Spring	Exam Session	Exam	Credit		
Language	Code	Section	Teacher	Specialization	p	l	e	p	l	e	p
F	<b>Engineering internship credited with master project (master in Electrical and Electronical engineering)</b> EE-597	EL	Profs divers		320h	320h	320h	320h	Sum Win	During the semester	0

**Master project in Electrical and Electronic  
Engineering**  
EE-599 EL Profs  
divers

900h

900h Sum  
Win

Oral

30

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