# Studies Plan

## Génie électrique et électronique 2025-26

**Block 2 : Labs and projects**

| Lang. | Code | Sect. | Teacher | Specialization | M1 C | M1 E | M1 L | M1 T | M1 P | M1 I | M2 C | M2 E | M2 L | M2 T | M2 P | M2 I | Exam Session | Exam | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Innovation & entrepreneurship in engineering** |||||||||||||||||||
| E | MGT-555 | MTE | Michaud Weber | | 2h | | 8h | | | | | | | | | | Win | During the semester | 10 |
| **Lab in acoustics** |||||||||||||||||||
| E | EE-490(a) | EL | Lissek | | | | 4h | | | | | | | | | | Win | During the semester | 4 |
| **Lab in advanced VLSI design** |||||||||||||||||||
| E | EE-490(b) | EL | Burg Levisse | | | | | | | | | | 4h | | | | Sum | During the semester | 4 |
| **Lab in microwaves** |||||||||||||||||||
| E | EE-490(e) | EL | Skrivervik | | | | | | | | | | 4h | | | | Sum | During the semester | 4 |
| **Lab in nanoelectronics** |||||||||||||||||||
| E | EE-490(i) | EL | Kis | | | | 4h | | | | | | | | | | Win | During the semester | 4 |
| **Lab in power electronics** |||||||||||||||||||
| E | EE-490(c) | EL | Dujic | | | | 4h | | | | | | | | | | Win | During the semester | 4 |
| **Lab in signal and image processing** |||||||||||||||||||
| E | EE-490(f) | EL | Thiran | | | | | | | | | | 4h | | | | Sum | During the semester | 4 |
| **Lab on app development for tablets and smartphones** |||||||||||||||||||
| E | EE-490(g) | EL | Ansaloni | | | | 4h | | | | | | | | | | Win | During the semester | 4 |
| **Lab on cell-free synthetic biology** |||||||||||||||||||
| E | EE-490(j) | EL | Maerkl | | | | 4h | | | | | | | | | | Win | During the semester | 4 |
| **Project in AI and machine learning** |||||||||||||||||||
| E | EE-492(k) | EL | Profs divers | | | | | | 10h | | | | | | 10h | | Sum Win | During the semester | 10 |
| **Project in edge computing and IoT** |||||||||||||||||||
| E | EE-492(j) | EL | Profs divers | | | | | | 10h | | | | | | 10h | | Sum Win | During the semester | 10 |
| **Project in energy science and technology** |||||||||||||||||||
| E | EE-492(z) | EL | Profs divers | | | | | | 10h | | | | | | 10h | | Sum Win | During the semester | 10 |
| **Project in information technologies and signal processing** |||||||||||||||||||
| E | EE-492(l) | EL | Profs divers | | | | | | 10h | | | | | | 10h | | Sum Win | During the semester | 10 |
| **Project in microelectronics** |||||||||||||||||||
| E | EE-492(a) | EL | Profs divers | | | | | | 10h | | | | | | 10h | | Sum Win | During the semester | 10 |
| **Project in nano and optoelectronics** |||||||||||||||||||
| E | EE-492(i) | EL | Profs divers | | | | | | 10h | | | | | | 10h | | Sum Win | During the semester | 10 |
| **HSS : Introduction to project** | | SHS | | | | | | | | | | | | | | | Win | | 3 |
| **HSS : Project** | | SHS | | | | | | | | | | | | | | | Sum | | 3 |

**Group "options"**

| Courses | Master 1 | Master 2 | Exam | Exam | Credit |
|---|---|---|---|---|---|

C : Course, E : Exercise, L : Lab, TP : Practical work, P : Course based project, I : Individual project, * : option course  / F : French courses, D : Deutsch courses, E : English Courses  /  Sum : Summer, Win : Winter

| Course | Lang. | Code | Sect. | Teacher | C | E | L | TP | P | I | Session | Exam | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adaptation and learning | E | EE-566 | EL | Sayed | 2h | 2h | | | | | Sum | During the semester | 4 |
| Advanced analog integrated circuit design | E | EE-523 | EL | Shoaran | 2h | 1h | | | | | Sum | Written | 3 |
| Advanced computer architecture | E | CS-470 | IN | Ienne | 3h | | 2h | | | | Sum | Written | 8 |
| Advanced lab in electrical energy systems | E | EE-588 | EL | Hodder Robert | | | 4h | | | | Sum | During the semester | 4 |
| Advanced multiprocessor architecture | E | CS-471 | IN | Falsafi | 4h | | | | 8h | | Win | During the semester | 8 |
| Advanced networks | E | COM-407 | SC | Nikolopoulos | 2h | 2h | 2h | | | | Win | Written | 8 |
| Analog circuits for biochip | E | EE-518 | EL | Carrara Schmid Skrivervik | 2h | 1h | | | | | Sum | Written | 3 |
| Antennas | E | EE-446 | EL | Fleury Jafargholi Skrivervik | 2h | 2h | | | | | Win | During the semester | 4 |
| Applied biomedical signal processing | E | EE-512 | EL | Lemay | 2h | | 2h | | | | Win | Written | 4 |
| Applied data analysis | E | CS-401 | SC | Brbic | 2h | | | | 2h | | Win | Written | 8 |
| Applied Electromagnetics for Metamaterial Design | F | MICRO-449 | MT | Achouri | 3h | | | | | | Win | Oral | 3 |
| Audio engineering | E | EE-548 | EL | Lissek | 2h | 2h | | | | | Win | Written | 4 |
| Automatic speech processing | E | EE-554 | EL | Magimai Doss | 2h | 2h | | | | | Win | Written | 4 |
| Basics in bioinstrumentation | E | BIOENG-421 | SV | Merten | 1h | 1h | 2h | | | | Win | During the semester | 4 |
| Bioelectronics and biomedical microelectronics | E | EE-519 | EL | Schmid | 2h | 1h | | | | | Win | Written | 3 |
| Bio-nano-chip design | E | EE-517 | EL | Carrara | 2h | 2h | | | | | Win | Written | 4 |
| Causal inference | E | MGT-416 | MTE | Kiyavash | 2h | 1h | | | | | Sum | During the semester | 4 |
| Classical and quantum photonic transducers | E | MICRO-410 | MT | | 2h | 1h | | | | | Sum | Oral | 3 |
| Computational neurosciences: neuronal dynamics | E | NX-465 | NX | Gerstner | 2h | 2h | | | | | Sum | Written | 5 |
| Computational optical imaging | E | MICRO-421 | MT | Psaltis | 3h | 1h | | | | | Sum | During the semester | 4 |
| Concurrent engineering of space missions | E | ENG-411 | EL | Udriot Verkammen | 1h | | | | 3h | | Sum | During the semester | 2 |
| Data visualization | E | COM-480 | SC | Vuillon | 2h | | | | 2h | | Sum | During the semester | 6 |
| Deep learning | E | EE-559 | EL | Cavallaro | 2h | 2h | | | | | Sum | During the semester | 4 |

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| | Course | | Instructor | H1 | H2 | H3 | H4 | H5 | Season | Exam | Credits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | **Deep learning for autonomous vehicles** CIVIL-459 | GC | Alahi | | | | 2h | 4h | Sum | During the semester | 6 |
| E | **Deep learning for optical imaging** MICRO-573 | MT | | | | | 2h | 1h | Sum | During the semester | 3 |
| E | **Design technologies for integrated systems** CS-472 | IN | De Micheli Mallasen Quintana Schiavone | 3h | 2h | | | | Win | During the semester | 6 |
| E | **Discrete optimization** MATH-261 | MA | Eisenbrand | | | | 2h | 2h | Sum | Written | 5 |
| E | **Distributed information systems** CS-423 | SC | | 2h | 1h | 1h | | | Win | Written | 6 |
| E | **Distributed intelligent systems** ENG-466 | SIE | Martinoli | 2h | 2h | 1h | | | Win | Oral | 5 |
| E | **Electromagnetic compatibility** EE-576 | EL | Rachidi-Haeri | | | | 3h | 1h | Sum | During the semester | 4 |
| E | **Embedded system design** CS-476 | IN | Kluter | | | | 2h | 2h | Sum | During the semester | 6 |
| E | **Energy conversion and renewable energy** ME-409 | GM | Maréchal Nguyen | 2h | 1h | 1h | | | Win | Written | 4 |
| E | **Energy storage in power systems: technologies, applications and future needs** EE-466 | EL | Sossan | 2h | 1h | | | | Win | Written | 3 |
| E | **Energy systems engineering** ChE-304 | CGC | Luterbacher | | | | 2h | 1h | Sum | During the semester | 3 |
| E | **Fundamentals & processes for photovoltaic devices** MICRO-565 | MT | Ballif | | | | 2h | 1h | Sum | Written | 3 |
| E | **Fundamentals of biomedical imaging** PHYS-438 | PH | Xin | | | | 2h | 2h | Sum | Written | 4 |
| E | **Fundamentals of biosensors and electronic biochips** EE-515 | EL | Guiducci | 2h | 1h | | | | Win | Written | 3 |
| E | **Fundamentals of VLSI design** EE-429 | EL | Burg Levisse | 3h | 1h | 2h | | | Win | Written | 6 |
| E | **Hydropower plants: generating and pumping units** EE-456 | EL | Vagnoni | 1h | 1h | | | | Win | Written | 2 |
| E | **Image analysis and pattern recognition** EE-451 | EL | Thiran | | | | 2h | 2h | Sum | During the semester | 4 |
| E | **Image and video coding** EE-569 | EL | Ebrahimi | 3h | | 1h | | | Win | Oral | 4 |
| E | **Industrial automation** CS-487 | SC | Sommer Tournier | | | | 2h | 1h | Sum | Oral | 3 |
| E | **Industrial electronics I** EE-465 | EL | Dujic | 2h | 2h | | | | Win | Oral | 4 |
| E | **Industrial electronics II** EE-565 | EL | Dujic | | | | 2h | 2h | Sum | Oral | 4 |
| E | **Information theory and coding** COM-404 | SC | Telatar | 4h | 2h | | | | Win | Written | 8 |

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| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Introduction to bioengineering** | | | | | | | | | | | |
| E | EE-526 | EL | Maerkl | | | 2h 1h | | | Sum | Written | 3 |
| **Introduction to quantum science and technology** | | | | | | | | | | | |
| E | QUANT-400 | SIQ | Charbon Macris Scarlino | 3h 1h | | | | | Win | Written | 5 |
| **Introduction to the design of space mechanisms** | | | | | | | | | | | |
| E | EE-580 | EL | Feusier | | | 2h | | | Sum | Oral | 2 |
| **Large-scale data science for real-world data** | | | | | | | | | | | |
| E | COM-490 | SC | Bouillet Delgado Sarni Verscheure | | | | 4h | | Sum | During the semester | 6 |
| **Lessons learned from the space exploration** | | | | | | | | | | | |
| E | EE-582 | EL | Toussaint | | | 2h | | | Sum | During the semester | 2 |
| **Life cycle assessment in energy systems** | | | | | | | | | | | |
| E | ENV-510 | EL | Margni | 2h 1h | | | | | Win | During the semester | 3 |
| **Machine learning** | | | | | | | | | | | |
| E | CS-433 | IN | West | 4h 2h | 2h | | | | Win | Written | 8 |
| **Machine learning I** | | | | | | | | | | | |
| E | MICRO-455 | MT | Billard | 4h | | | | | Win | Written | 4 |
| **Mathematics of data: from theory to computation** | | | | | | | | | | | |
| E | EE-556 | EL | Cevher | 3h | 3h | | | | Win | Written | 6 |
| **Media security** | | | | | | | | | | | |
| E | EE-552 | EL | Ebrahimi | | | 2h 1h | | | Sum | Written | 6 |
| **Microwaves, the basics of wireless communications** | | | | | | | | | | | |
| E | EE-445 | EL | Skrivervik | 2h 2h | | | | | Win | During the semester | 4 |
| **Mobile networks** | | | | | | | | | | | |
| E | COM-405 | SC | Al Hassanieh | 3h 2h 2h | | | | | Win | Written | 8 |
| **Model predictive control** | | | | | | | | | | | |
| E | ME-425 | GM | Jones | 2h 2h | | | | | Win | Written | 4 |
| **Multivariable control** | | | | | | | | | | | |
| E | ME-422 | GM | Ferrari Trecate | 2h 2h | | | | | Win | Written | 4 |
| **Nanoelectronics** | | | | | | | | | | | |
| E | EE-535 | EL | Ionescu | 2h | | | | | Win | Written | 2 |
| **Nanophotonics** | | | | | | | | | | | |
| E | MICRO-516 | MT | Iadanza Moselund | | | 2h 1h | | | Sum | Oral | 3 |
| **Networked control systems** | | | | | | | | | | | |
| E | ME-427 | GM | Ferrari Trecate | 2h 1h | | | | | Win | Written | 3 |
| **Network machine learning** | | | | | | | | | | | |
| E | EE-452 | EL | Frossard Thanou | | | 2h | | 2h | Sum | During the semester | 4 |
| **Neural interfaces** | | | | | | | | | | | |
| E | NX-422 | NX | Lacour Shoaran | 4h 2h | | | | | Win | During the semester | 6 |
| **Optical detectors** | | | | | | | | | | | |
| E | MICRO-523 | MT | Bruschini | 2h 1h | | | | | Win | Oral | 3 |
| **Optimal decision making** | | | | | | | | | | | |
| E | MGT-483 | MTE | Kuhn | | | 2h 2h | | | Sum | Written | 4 |
| **Photonic systems and technology** | | | | | | | | | | | |
| E | EE-440 | EL | Brès | | | 2h 2h | | | Sum | Written | 4 |
| **Physical models for micro and nanosystems** | | | | | | | | | | | |
| E | EE-536 | EL | Kis | 2h | | | | | Win | During the semester | 2 |
| **Physics of photonic semiconductor devices** | | | | | | | | | | | |
| E | PHYS-434 | PH | Butté | | | 2h 2h | | | Sum | Written | 4 |
| **Power system restructuring** | | | | | | | | | | | |

| Courses | | | | | Master 1 | | | | | | Master 2 | | | | | | Exam Session | Exam | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lang. | Code | Sect. | Teacher | Specialization | C | E | L | T | P | I | C | E | L | T | P | I | | | |
| | **and deregulation** | | | | | | | | | | | | | | | | | | |
| E | EE-570 | EL | Cherkaoui | | | | | | | | 2h | 1h | | | | | Sum | During the semester | 3 |
| | **Project in electrical engineering** | | | | | | | | | | | | | | | | | | |
| E | EE-491 | EL | Profs divers | | | | | | | | 10h | | | | 10h | | Sum Win | During the semester | 10 |
| | **Radio frequency circuits design techniques** | | | | | | | | | | | | | | | | | | |
| E | EE-426 | EL | Ruffieux | | 2h | 2h | | | | | | | | | | | Win | Written | 4 |
| | **Reinforcement learning** | | | | | | | | | | | | | | | | | | |
| E | EE-568 | EL | Cevher | | | | | | | | 2h | 2h | | | 2h | | Sum | During the semester | 6 |
| | **Research project in electrical engineering** | | | | | | | | | | | | | | | | | | |
| E | EE-573 | EL | Profs divers | | | | | | | | 22h | | | | | | Win | During the semester | 22 |
| | **Selected topics in advanced optics** | | | | | | | | | | | | | | | | | | |
| E | MICRO-420 | MT | Martin | | 3h | | | | | | | | | | | | Win | Oral | 3 |
| | **Semiconductor devices II** | | | | | | | | | | | | | | | | | | |
| E | EE-567 | EL | Ionescu Kis | | | | | | | | 2h | 2h | | | | | Sum | During the semester | 4 |
| | **Semiconductor physics and light-matter interaction** | | | | | | | | | | | | | | | | | | |
| E | PHYS-433 | PH | Butté | | 2h | 2h | | | | | | | | | | | Win | Written | 4 |
| | **Seminar in physiology and instrumentation** | | | | | | | | | | | | | | | | | | |
| | MICRO-568 | MT | Radenovic | | 2h | | | | | | | | | | | | Win | Written | 2 |
| | **Sensors in medical instrumentation** | | | | | | | | | | | | | | | | | | |
| E | EE-511 | EL | Chételat Ionescu | | | | | | | | 2h | 1h | | | | | Sum | Written | 3 |
| | **Smart sensors for IoT** | | | | | | | | | | | | | | | | | | |
| E | EE-594 | EL | Ionescu | | 2h | 1h | | | | | | | | | | | Win | Written | 3 |
| | **Spacecraft design and system engineering** | | | | | | | | | | | | | | | | | | |
| E | EE-584 | EL | David Udriot | | 2h | | | | 2h | | | | | | | | Win | During the semester | 5 |
| | **Space mission design and operations** | | | | | | | | | | | | | | | | | | |
| E | EE-585 | EL | Kuntzer | | 2h | | | | | | | | | | | | Win | Oral | 2 |
| | **Space propulsion** | | | | | | | | | | | | | | | | | | |
| E | ENG-510 | EL | Jäger | | | | | | | | 2h | 1h | | | | | Sum | Oral | 3 |
| | **Space sustainability, a multidisciplinary approach** | | | | | | | | | | | | | | | | | | |
| E | EE-587 | EL | David Udriot | | | | | | | | 1h | 1h | | | | | Sum | Oral | 2 |
| | **Sustainability and materials** | | | | | | | | | | | | | | | | | | |
| E | MSE-341 | MX | Abitbol | | | | | | | | 2h | 1h | | | | | Sum | During the semester | 3 |
| | **Sustainability assessment of urban systems** | | | | | | | | | | | | | | | | | | |
| E | ENV-461 | SIE | Binder | | | | | | | | 2h | | | | 1h | | Sum | Written | 3 |
| | **System programming for Systems-on-chip** | | | | | | | | | | | | | | | | | | |
| E | CS-473 | IN | Kluter | | 2h | 2h | | | | | | | | | | | Win | During the semester | 6 |
| | **Systems and architectures for signal processing** | | | | | | | | | | | | | | | | | | |
| E | EE-555 | EL | Mattavelli | | 2h | 1h | | | | | | | | | | | Win | Oral | 3 |
| | **Test of VLSI systems** | | | | | | | | | | | | | | | | | | |
| E | EE-530 | EL | Schmid | | 2h | | | | | | | | | | | | Win | Written | 2 |
| | **Transdisciplinary project** | | | | | | | | | | | | | | | | | | |
| E | EE-493 | EL | Profs divers | | | | | | | | | | | | 4h | | Sum | During the semester | 4 |

**Group 1**

| Courses | | | | | Master 1 | | | | | | Master 2 | | | | | | Exam Session | Exam | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lang. | Code | Sect. | Teacher | Specialization | C | E | L | T | P | I | C | E | L | T | P | I | | | |
| | **Convex optimization** | | | | | | | | | | | | | | | | | | |
| E | MGT-418 | MTE | Kuhn | | 2h | 2h | | | | | | | | | | | Win | Written | 5 |
| | **Fundamentals of analog VLSI** | | | | | | | | | | | | | | | | | | |

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| Lang. | Code | Sect. | Teacher | Specialization | Master 1 C E L T P I | Master 2 C E L T P I | Exam Session | Exam | Credit |
|---|---|---|---|---|---|---|---|---|---|
| **design** | | | | | | | | | |
| E | EE-424 | EL | Enz | | 2h 2h | | Win | Written | 4 |
| **Fundamentals of inference and learning** | | | | | | | | | |
| E | EE-411 | EL | Krzakala | | 2h | 2h | Win | During the semester | 4 |
| **Semiconductor devices I** | | | | | | | | | |
| E | EE-557 | EL | Matioli | | 3h 1h | | Win | During the semester | 4 |
| **Smart grids technologies** | | | | | | | | | |
| E | EE-472 | EL | Paolone | | | 2h 1h 2h | Sum | Written | 5 |
| **Wireless receivers: algorithms and architectures** | | | | | | | | | |
| E | EE-442 | EL | Burg | | 2h 2h | | Win | During the semester | 4 |

**Internship**

| Lang. | Code | Sect. | Teacher | Specialization | Master 1 C E L T P I | Master 2 C E L T P I | Exam Session | Exam | Credit |
|---|---|---|---|---|---|---|---|---|---|
| **Engineering internship (master in Electrical and Electronical engineering)** | | | | | | | | | |
| F | EE-596(a) | EL | Profs divers | | 680h | 680h | Sum Win | During the semester | 30 |

**Master project**

| Lang. | Code | Sect. | Teacher | Specialization | Master 1 C E L T P I | Master 2 C E L T P I | MP Autumn C E L T P I | MP Spring C E L T P I | Exam Session | Exam | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Engineering internship credited with master project (master in Electrical and Electronical engineering)** | | | | | | | | | | | |
| F | 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 |