



MASTER IXEO

## High Frequency Electronics & Photonics training path

Level	Program duration	Credits
Master	2 years	120 credits

### Program outline

This Master's program is based on the IXEO Master's degree in Applied Physics and Engineering Physics, electronics-optics. Students will be trained in the fields of electronics and high-frequency photonics through a research-oriented approach with projects and laboratory internships, at XLIM or abroad.

### Admissions requirements

Must hold a Bachelor's degree in "Electronics, electrical energy, automation" or a degree in "Physics" or "Sciences for engineers" or "Sciences and technologies" with a specialization in high frequency electronics and/or optics.

### Organization

- Internship in M1 (international mobility)
- End-of-study internship in M2
- Scientific project in M2

### How to apply

Students residing in France or the EU: [www.monmaster.gouv.fr](http://www.monmaster.gouv.fr)

International students from outside the EU:  
[www.campusfrance.org/fr](http://www.campusfrance.org/fr)

### Key info

- Selective course (limited places)
- No repetition possible in TACTIC course
- Scholarships 6000€ (4000€ in M1, 2000€ in M2)
- Financial assistance for incoming and outgoing mobility

### Study place

Campus La Borie, Limoges

### Program contact

M1 :  
[sebastien.fevrier@unilim.fr](mailto:sebastien.fevrier@unilim.fr)

M2 :  
[guillaume.andrieu@unilim.fr](mailto:guillaume.andrieu@unilim.fr),  
[cyril.decroze@unilim.fr](mailto:cyril.decroze@unilim.fr)

### Graduate school contact

[tactic-gradschool@unilim.fr](mailto:tactic-gradschool@unilim.fr)

### University contact

[msscience@unilim.fr](mailto:msscience@unilim.fr)

## What's next ?

- **Continuation of study**

Continuation in thesis possible.

- **Job opportunities**

**Jobs:** R&D engineer, project engineer, researcher, assistant professor

**Sectors:** Industrial groups, start-ups and SMEs: space, civil, defense applications, high-frequency components and technologies for communication sciences, photonic technologies (laser, imaging, etc.)

## Program

### Semester 1

Course name	Course unit (UE or component)	Nbr h Lecture	Nbr h Tutorial	Nbr h Practice	Credits
Electromagnetic theory for high frequency circuits and antennas	UE	42h	24h	24h	9
Optical propagation	UE	27h	19h	34h	8
Active circuits and nonlinear devices	UE	42h	24h	24h	9
Modulations and demodulations for RF front-end and devices	UE	17h	6h	32h	4

### Semester 2

Course name	Course unit (UE or component)	Nbr h Lecture	Nbr h Tutorial	Nbr h Practice	Credits
Language (English or French)	UE	0h	30h	0h	3
Soft skills	UE	20h	10h	0h	3
Abroad internship	Internship				3
Laboratory research at XLIM	Project				6

<b>Elective training path :</b>					
<b>Electronic</b>					
Passive microwave components, antennas and transmission systems	UE	18h	8h	24h	5
Modeling and CAD of RF and microwave devices	UE	17h	6h	32h	6
Material properties & characterisation	UE	9h	0h	21h	3
<b>Photonic</b>					
Passive microwave components, antennas and transmission systems	UE	18h	8h	24h	5
Laser	UE	20h	10h	0h	3
Nonlinear optics	UE	26h	14h	0h	4
Novel light sources	UE	9h	0h	21h	3
<b>IOT</b>					
Modeling and CAD of RF and microwave devices	UE	17h	6h	32h	6
Smart Energy	UE	18h	22h	0h	3
Physics and technologies for devices	UE	31h	0h	9h	6

### Semester 3

Course name	Course unit (UE or component)	Nbr h Lecture	Nbr h Tutorial	Nbr h Practice	Credits
CAD for engineering	UE	28h	0h	62h	3
<b>Elective courses (3 out of 6)</b>					
• Antennas and EM compatibility for RF systems	UE	30h	0h	0h	6
• Passive components and devices for RF systems	UE	30h	0h	0h	6
• Nonlinear components and devices for RF systems	UE	30h	0h	0h	6
• Printed electronics for telecommunication and energy harvesting	UE	15h	0h	0h	3

<ul style="list-style-type: none"> <li>Advanced photonic sources and systems</li> </ul>	UE	37.5h	0h	0h	7.5
<ul style="list-style-type: none"> <li>Telecom systems and networks</li> </ul>	UE	7.5h	0h	0h	1.5
<b>Elective courses (1 out of 4)</b>					
<ul style="list-style-type: none"> <li>Materials and nonlinear optics</li> </ul>	UE	10h	0h	20h	3
<ul style="list-style-type: none"> <li>Additive Manufacturing and RF technology processes</li> </ul>	UE	9h	0h	21h	3
<ul style="list-style-type: none"> <li>Bio-Engineering</li> </ul>	UE	18.5h	1.5h	10h	3
<ul style="list-style-type: none"> <li>Energy Harvesting</li> </ul>		17h	10h	3h	3
Language (English or French)	UE	0h	30h	0h	3
Research or entrepreneurial project	Project				3

#### Semester 4

Course name	Course unit (UE or component)	Nbr h Lecture	Nbr h Tutorial	Nbr h Practice	Credits
<b>Elective courses (2 out of 3)</b>					
<ul style="list-style-type: none"> <li>Front-End and RF Architectures for Satellites</li> </ul>	UE	15h	15h	0h	3
<ul style="list-style-type: none"> <li>Microelectronics RF, Micro and Nano Technologies</li> </ul>	UE	15h	15h	0h	3
<ul style="list-style-type: none"> <li>Design, fabrication and characterization of fiber-based laser systems</li> </ul>	UE	4.5h	1.5h	24h	3
Research or entrepreneurial project	Project				3
End of study internship (master's thesis)	Internship				24

The information on this page is for information purposes and is not contractual

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