

# EDUCATION PROGRAMME MASTER OF SCIENCE IN ENGINEERING DEGREE (DIPLÔME D'INGÉNIEUR.E) SupOptique

#### **OVERVIEW**

Since 1917, Institut d'Optique is the higher education and research institution of photonics in France and worldwide leader in this field for education, research and innovation.

The education programme is designed to train SupOptique engineers, providing them with:

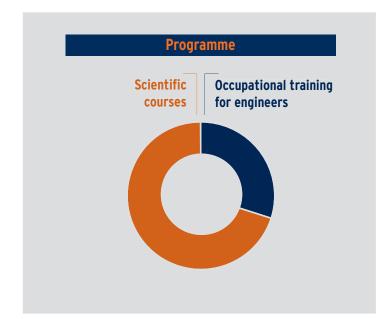
- An unrivalled level of scientific and technological expertise in photonics
- A comprehensive training to the professions of engineer
- A graduate school open on the world.

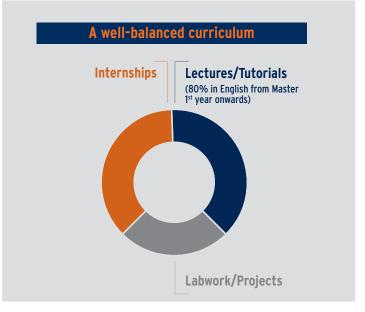
#### **EDUCATION TRACKS**

- 20 different thematic tracks
- A dedicated education (regular, entrepreneurship, co-op / apprenticeship programme in a company)
- 80% of the courses offered in English from Master 1st year onwards
- A wide choice of double-degrees in France and abroad.

#### **CAREERS**

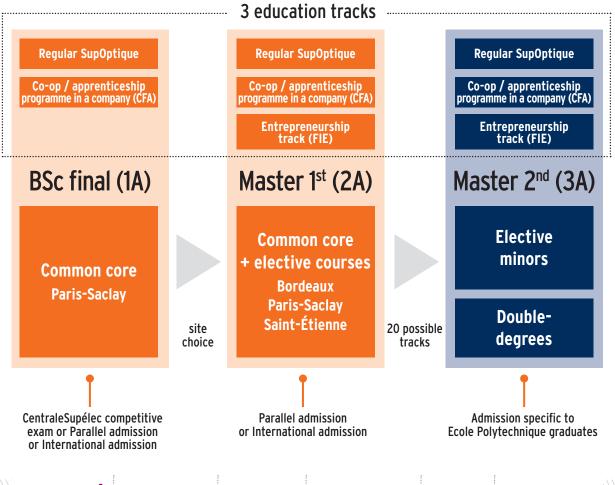
- The average hiring time for the graduates is 2 weeks
- When starting their careers, SupOptique engineers work in majority in R&D, either in companies or in academic research.
   15% create their start-up company
- After 5 years, SupOptique engineers become project managers, unit managers, product managers or executive managers in companies mainly involved in photonics
- Employers are active in aerospace, defense, lasers, automotive, lighting, biomedical and telecommunications industries. 10% of the graduates chose finance or auditing.





## 3 EXCELLENCE TRACKS

#### FOR AN A-LA-CARTE EDUCATION





université BORDEAUX







IFSBM INSTITUT DE FORMATION SUPÉRIEURE BIOMÉDICALE

# A STRONG FOOTHOLD IN R&D

#### A CLOSE LINK WITH COMPANIES

# **© RESEARCH AT THE HEART OF TEACHING**

Institut d'Optique hosts three outstanding research centres, operated by faculty staff of worldwide renown. Their expertise in optics and photonics is at the core of the school's education approach.



Each cohort of students is sponsored by a high-tech company, such as Thalès, Nokia, Safran, ArianeGroup/Sodern, Lumibird, HGH Infradred, ...



503 gathers, in a same location, engineering students in the entrepreneurship track and innovative companies. Students learn from the experience of field actors in this ecosystem dedicated to innovation.

A degree programme that brings together fundamental physics concepts and technological innovations

## **EDUCATION**

#### AT SUPOPTIQUE

#### MASTER OF SCIENCE IN ENGINEERING

# FINAL BSc YEAR (1ère Annee): FOUNDATIONS

A base of demanding courses to **UNDERSTAND** the fundamental concepts of the Physics of Light and **PUT INTO PRACTICE** the essential instruments and core methods of the SupOptique engineers, which they will deepen during the remaining of the programme.

#### Wave Physics Light electromagnetism

Quantum Physics Wave optics Electromagnetism Polarization

# Optical instrumentation & photonic components

Semiconductors Lasers Geometrical optics

#### Information flow

Mathematics: electronic analysis C programming language Digital calculus

## The engineer in the society

Economics & Companies
Communication
Teamwork
Drama workshops
Student association
projects
Engineer & ecological
transition
English & 2nd foreign
language

## COMMON CORE

#### OPTICS WAVES & MATTER

To understand the nature of light

# OPTICAL & PHOTONIC TECHNOLOGIES

To master light

#### SIGNAL & INFORMATION

To use light

#### General teachings

for engineers

# MASTER 1st YEAR (2èME ANNEE): PROFICIENCY

The core of the programme gives the students the advanced conceptual keys to ANALYSE complex physical situations and photonic systems. It enables them to CREATE their own solutions to technical questions while consolidating and combining their skills in the physics of light, instrumentation and signal processing in a thorough engineer-physicist approach.

#### Coherent Optics & Light-matter Interaction

Atom physics Non-linear optics Fourier optics

#### Photonic systems engineering

Optical systems design Radiometry & colorimetry Detection systems Guided waves optics & communications

#### Signal processing

Scientific calculus Automation Interfacing Digital control

# The engineer & the corporate world

Negociation, Relational intelligence, Conflict management Knowledge of the corporate world Innovation & creativity

Team management Accounting and financial management

English & 2nd foreign language

#### advanced conceptual keys

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Electro & acousto-optics IT theory
Optics for energy Image processing Optics & art

# MASTER 2<sup>ND</sup> YEAR (3<sup>èME</sup> ANNEE): EXPERTISE

The final year transforms SupOptique students into experts of their field, able to EVALUATE and REVIEW technical solutions, scientific results, including their own proposals. They acquire the ability to formulate them as competent and self-demanding professionals, aware of the human, economic, financial, social and environmental dimensions of their profession.

#### Engineering minors & Double-degree Masters

Nanosciences

Advanced engineering of optical systems

Optical networks & communications

Plasmas & fusion sciences

Signal and image processing

Light-matter interaction

Appearance & vision

Lighting & embedded systems

Optical IT

Biophotonics

## Professional integration

Engineering & ethics
Psychosocial risks
awareness
Project management
Patents, intellectual
property
English & 2<sup>nd</sup> foreign
language

# A 3-STEP CURRICULUM:

#### **UNDERSTAND, MASTER, APPLY**

BSc FINAL (1A)

Common core - UNDERSTAND - PRACTICE

Photonics, Physics, App maths, Digital, Electronics Training to the professions of engineer Internship (1 month)

MSc 1st (2A)

Common core - MASTER - ANALYZE

Photonics, Physics, App maths, Digital, Electronics Training to the professions of engineer Internship (3 months)

Gap-year possibility (12 months)

MSc 2<sup>nd</sup> (3A) **Elective minors - APPLY - EVALUATE** or double-degrees (FRANCE or INTERNATIONAL), or masters in research or specialized masters

Internship (6 months)

Master of Science in Engineering degree (Diplôme d'ingénieur∙e) from Institut d'Optique

100%

of the students have an experience abroad of at least 16 weeks (12 weeks for the co-op/ apprenticeship track) 30%

30% of the students in an international track

## A TYPICAL WEEK

#### AT SUPOPTIQUE

	Monday	Tuesday	Wednesday	Thursday	Friday
9Н	Labwork / Projects	English	Labwork / Projects	Lectures / Tutorial classes	Lectures / Tutorial classes
12H15		Computer science			
				R&D conference	
14H	Lectures / Tutorial classes	Opening project / Innovation / Entrepreneurship	2 <sup>nd</sup> foreign language	Students' associations / Sports	Labwork / Projects
17H15			Humanities and social sciences		
		Individual tutoring			

#### **BEING PART OF AN ALUMNI COMMUNITY**

Photonics worldwide is a community of researchers and engineers with a passion for the physics of light. SupOptique Alumni are part of these thriving people, companies and research centres. The Alumni association is present on campuses and accompanies students in their professional integration. It weaves strong networks between all the cohorts.