Master Nano-optics and Nanophotonics (NANO-PHOT)

Nano-optics & Nanophotonics (NANO-PHOT) is a master in Applied Physics and Physical Engineering, focused on light-matter interaction at the nanoscale. It is part of the national master's degree in Science, technology and health delivered at UTT.

Introduction

Nano-Optics is the combination of "Optics" and "nanotechnology". This topic deals with light-matter interaction at the nanoscale, that is at a scale which is much smaller than the light wavelength. At this scale, the role of evanescent waves is crucial and the optical properties of materials are generally different from what they are at the microscale, opening plenty of new avenues and applications to be explored. This Research field is at the crossroad of at least 2 of the 6 Key Enabling Technologies, defined by the European Community as a priority of its industrial policy, given its connection to socioeconomic stakes in the fields of energy, telecommunications, security, health and environment.

Note: This master specialty is one of the 3 available under the cursus named "Mention Applied Physics and Physical Engineering". It is jointly awarded by UTT and the Université de Reims Champagne-Ardenne.

- Physique, Spectrométrie, Ingénierie et Instrumentation (M1 et M2 à Reims)
- Mécanique, Matériaux et Procédés Avancés (M2 à l'UTT)
- Nano-optics & Nanophotonics (M1 à Reims et à l'UTT - M2 à l'UTT)

The Nano-optics & Nanophotonics master is supported by the Nano-Phot graduate school which aims at training masters and PhDs for R&D jobs in Nanophotonics and Nanosciences. This program benefits from a specific financial support of the National Agency of Research.

Pedagogical objectives

The NANO-PHOT training is based on a teaching of nano-optics and photonics as a transverse discipline allowing to approach a very open and particularly valorizing field: the nanotechnologies.

The NANO-PHOT course educates to the activities of Research & Development (R&D) in the field of nanotechnologies via the tools and methods of nano-optics (comprehension of the phenomena, modelling), the manufacturing of nanostructures and materials, the characterization of their physico-chemical properties notably by nanoscopy and nanospectroscopy.

Professionnal Objectives

This master training leads students in R&D in nanotechnologies, a field with a strong fundamental component and multiple applications: plasmonics, lighting, biomedical and

Duration

Une ou deux années universitaires, selon le niveau d'entrée

Internship(s)

Yes, Compulsory

Teaching languages

- Unknown label

Rhythm

- Full time
- With blocked release periods

Conditions

- Attending

environmental sciences (biosensors, energy production and storage, decontamination).

The program is taught entirely in English and is open to international students.

Objectives related to research

Research themes

The scientific objectives of the NANO-PHOT course concern the development of nano-optics and photonics in terms of science, technology and application. Four main themes are addressed: Emerging materials for nano-optics, nano-spectroscopy & nano-sensors, fundamental phenomena in nano-optics and photonics, and nano-fabrication.

Labs

The NANO-PHOT course is supported by several research teams from UTT and URCA:

- Light, Nanomaterials, Nanotechnologies (L2n/CNRS)
- The scientific and technological platform Nano'Mat comprising 1000 m² of clean room and equipment dedicated to nanotechnologies.
- The Laboratory of Research in Nanosciences (LRN)
- Institut de Thermique, Mécanique, Matériaux (ITheMM)
- BioSpectroscopie Translationnelle (BioSpecT)
- Fractionation of AgroResources and Environment lab (FARE)
- Matrice Extracellulaire et Dynamique Cellulaire (MEDyC)
- Stress Environnementaux et BIOsurveillance des milieux aquatiques (SEBIO)

3 reasons to choose this Master

A degree resolutely oriented towards Research & Development

The NANO-PHOT program allows students to enter the research field through academic studies (doctoral thesis) or in companies in internationally renowned laboratories.

An internationally oriented Master's degree

Delivered in English, the NANO-PHOT program is a gateway to an internationally oriented career path. It also provides access to double Master 2 degrees with partner universities (Taiwan, Germany, Mexico) via a semester abroad.

A recognized Master's degree

The NANO-PHOT program is a national Master's degree, widely recognized as a European graduate degree.

Training location

Université de Technologie de Troyes (except for the 1st semester of M1 which take place at URCA in case of admission in 1st year).

Information

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Responsable de la mention Physique Appliquée et Ingénierie Physique

https://candidature.utt.fr/en

Admission

Prerequisite

Prerequisites training

- Entry in 1st year-Master 1: Bachelor (180 ECTS)
- Entry in 2nd year - Master 2: Master 1 (240 ECTS) or equivalent French or foreign degree.

In the case of students who do not come from a European country, the jury will have to decide whether to admit them to the first or second year by evaluating the achievements of each student, of based on the documents provided

Specific routes

- UTT double diploma,for students already registered at UTT as engineer students.

Apply Application Help (pdf)

What's next ?

Level of education obtained after completion

Level of education obtained after completion

- Bac +5
- National Master's Degree (DNM)

Further studies

The training attests to the aptitude for research and allows to be directed towards an R&D career. The pursuits in thesis, notably within the framework of the Nano-Phot graduate school are very common.

More information: https://nano-phot.utt.fr/career-opportunities-2

Program

Course organization

Organization of the M1 courses

The M1 courses are described on the graduate school website here.
The detailed program for both years is available here (pdf).

Organization of the M2 courses

The M2 courses are described in more detail on the graduate school website here.

- Semester 1 (17 weeks from early September to mid-January)
- Semester 2: 6-month internship (from early February to late July)

The Master's degree completion requires a minimum level in a foreign language.