



École Nationale Supérieure de **Techniques Avancées** Bretagne

French State Graduate, Post-Graduate Engineering School
and Research Institute





[Aim high, sail far]

BECOME AN ENGINEER

Scientific and open-minded

ENSTA Bretagne trains engineers opened to the world honed to cutting-edge science and innovation. "Aim High, Sail Far" encapsulates the determination of our students to combine scientific excellence with a spirit of enterprise, team spirit and creativity.

"Aim High, Sail Far" also refers to the wide range of careers that our Alumni follow in different activity sectors: naval and offshore engineering, renewable marine energies, automobile and aerospace engineering, hydrography, pyrotechnics, defense, electronics, IT and Computing Science.

Finally, "Aim High, Sail Far" is this energy which characterizes Brest, a maritime city, European capital of marine sciences and technologies, where the institute draws upon almost two centuries of internationally recognized maritime expertise. The engineering courses in Hydrography, Oceanography, Naval architecture and Offshore engineering are among the most prized. Furthermore, the ENSTA Bretagne Research Center is a key component of the Brest Center of Maritime Excellence in several areas: submarine drones and observatories, surveillance and cartography of the oceans, durability of marine structures.



ENSTARTUPS, the ENSTA Bretagne incubator, hosts about 10 projects in the steps before creating a company. It is not merely a structure which supports innovation but also raises awareness and trains students in entrepreneurship.

An international outlook

ENSTA Bretagne boasts 88 academic bilateral agreements in 31 countries to receive foreign researchers and students and organize the international mobility of 100% of the students and numerous personnel.

Here are a few examples :

- **North America** : USA (Georgia Institute of Technology, Illinois Institute of Technology), Canada (Polytechnique Montréal, Dalhousie University in Halifax)
- **South America** : Argentina (Universidad de Buenos Aires), Brazil (Universidade Federal do Rio Grande do Sul), Chile (Universidade Austral de Chile)
- **Asia / Oceania** : Australia (AMC (Australian Maritime College), Flinders, University of South Australia), China (Tongji University, Ocean University of China, China University of Petroleum)
- **Europe** : Italy (Politecnico di Milano), the United Kingdom (Cranfield University), the Netherlands (Delft UT), Portugal (FEUP Porto).

> Our HISTORY

[1819]
Creation of the French Navy Arsenal Schools to provide training in naval architecture

[1971]
Creation of the Institute

[1990]
Competitive entrance examination opened to civilian students

[1992]
Beginning of research activities

[2005]
Research centre inaugurated by the Ministers of Defense, Higher Education and Research

[2006] Apprentice engineer training available

[2007]
ISO 9001:2000 certification for the entire range of activities

[2010]
Creation of the ENSTA Group with ENSTA ParisTech and adoption of the new name ENSTA Bretagne

[2016]
Creation of the ENSTARTUPS incubator

[2017]
Authorized to award Doctoral degrees



[Excellence]



ENSTA Bretagne of Brest, a public establishment dedicated to higher education and research created in 1971, is a provider of excellent training and a leader in research activities requiring an outstanding level of technical expertise.

ENSTA Bretagne, ENSTA ParisTech, ISAE-SUPAERO and Ecole polytechnique are 'Grandes Ecoles' under the Ministry of Armed Forces and share exacting standards of excellence which have been developed over the years as a self-fulfilling ambition.

ENSTA Bretagne campus, research centre, scientific and technological facilities sit at the cutting edge of progress and innovation.

Through its multidisciplinary training, ENSTA Bretagne aims to produce engineers capable of mastering the design of complex, industrial systems in an international environment, required by civil industries and the 'Direction Générale de l'Armement' (DGA), the French Military Procurement Agency: 80% of the students are civilians, 20% have military status.

The excellence of ENSTA Bretagne, recognized by its partners in research activities, training and industry, is a result of its quest for perpetual improvement. The Institute has been awarded ISO 9001 certification since 2007 for all of its activities.

The excellence of ENSTA Bretagne is appreciable through its privileged links with industry. The results of the annual employment surveys of its qualified engineers bespeak its quality: ENSTA Bretagne graduates enjoy rapid employment.

>>> The Institute trains engineers and experts for the most innovative activity sectors:
ENERGIES, ICT, NAVAL INDUSTRY, HYDROGRAPHY, AERONAUTICS & SPACE, AUTOMOTIVE, DEFENSE & SECURITY, RESEARCH & TRAINING, CONSULTING & ENGINEERING.

> ISO 9001:2015 certification for all its activities.

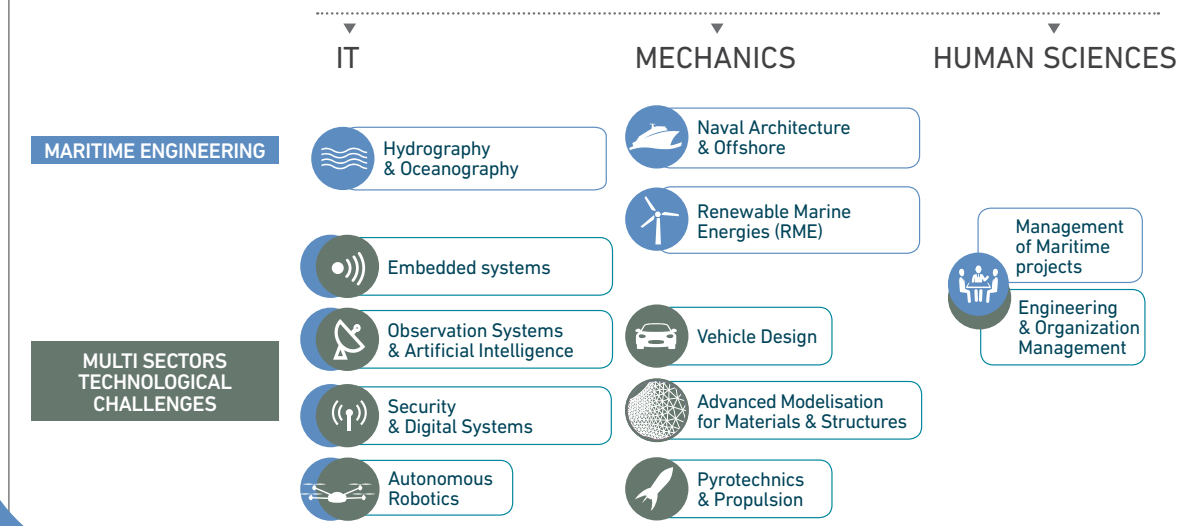


> Industry Partnerships

- AIRBUS, ARIANE GROUP, ALTEN,
- ALTRAN, AREVA, ASSYSTEM,
- AUTOLIV, AUTOSUSPENSIONS,
- BOSKALIS, BOSCH, BUREAU D'ÉTUDES MAURIC, BUREAU VERITAS, CAP GEMINI, CEA, CEGELEC, CENTIGON, CGG, CONSTRUCTIONS MÉCANIQUES DE NORMANDIE, CNES, CREDIT MUTUEL ARKEA, CS, DASSAULT SYSTÈMES, DETI, DGA, DORIS ENGINEERING, ECA, EDF, FAURECIA, FUGRO, GIST, GTT, GERMANISCHER LLOYD AG, HYDRODINAMICS CENTER, IFREMER, IPEV, IXBLUE, LEGOS, LIVBAG, NAVAL GROUP, NEXTER, OCCAR, ONET TECHNOLOGIES, ORANGE, PSA PEUGEOT CITROËN, RENAULT, SAFRAN, SAIPEM, SBM OFFSHORE, SEGULA, SHOM, SIEPEL, SOFRESID, SOGEFI GROUP, STRYKER BENOIST GIRARD, STX, SUBSEA 7, TECHNIP, THALES, TNO, TOTAL, TRELLEBORG, UNIOLOG, VALEO, VOLVO, ZODIAC, ZF...

A UNIQUE RANGE OF EXPERTISES

3 EDUCATION AND RESEARCH POLES





[Become an Engineer and an Expert]

ENSTA Bretagne is a multidisciplinary engineering Institute based in Brest (France), which offers specialized courses in Naval Architecture, Hydrography, Automotive Engineering, Energetic Materials, IT and related areas.

> **DIPLÔME D'INGÉNIEUR (i.e. MSc degree)**

- 9 options available:
 - Hydrography and Oceanography
 - Naval Architecture and Offshore Engineering
 - Vehicle Design
 - Advanced Modelisation for Materials & Structures
 - Observation Systems & Artificial Intelligence
 - Security & Digital Systems
 - Autonomous Robotics
 - Pyrotechnics & Propulsion
 - Organizational Management and Engineering

The Engineering degree is equivalent to a MSc in Engineering

> **MASTER OF SCIENCE (MSc degree)**

- Maritime Engineering: Offshore, Surface Ships and Submarines
- Hydrography
- Automotive Engineering taught in collaboration with two European partners
- Mobile robotics - marine applications
- Design & Security of Embedded Systems

> **ADVANCED MASTER (after a MSc degree)**

- Renewable Marine Energies
- Marine Engineering / Naval Architecture and Offshore Engineering
- Energetic Materials and Propulsion

> **DOCTORAL DEGREES**

ENSTA Bretagne is authorized to award doctoral degrees for the doctoral schools:

UBL – Engineering sciences (in mechanical sciences, IRDL laboratory) and UBL-MathSTIC (in information technologies, Lab-STICC laboratory)

- accredited by the Ministry of Higher Education and Research.

>>> **OPPORTUNITIES FOR INTERNATIONAL STUDENTS**

Programme	Type of stay	Duration	Minimum requirements	Students need to use French
Diplôme d'ingénieur (MSc in Engineering)	Degree-seeking	3 years	BSc degree	<i>Yes: course materials are in English, lessons are given in French, teachers are available to answer students' questions in English outside lessons.</i>
	Degree-seeking	2 years (the 2 final years of the programme)	4 years of university-level studies	
	Non degree-seeking (exchange students from partner universities)	1 to 2 semesters (in the 2 final years of the programme)	3 years of university-level studies	
Advanced Master (Mastère spécialisé Grande École)	Degree-seeking	1 year	MSc degree or BSc + several years of professional experience	
Master of Science	Degree-seeking	1 to 2 years, depending on prior qualifications or experience	BSc degree	No
PhD	Degree-seeking	3 years	MSc degree	No
Research Internship	For a Bachelor or Master's thesis or a post-doctoral stay	3 to 12 months	Depending on the ENSTA Bretagne laboratory	No



[Research]

The laboratories at ENSTA Bretagne conduct research in Mechanical Engineering, Signal Processing, Electronics, IT and Automation, as well as in Human Sciences.

3 Research & Teaching Departments integrated into 3 multi-establishment Laboratories

Mechanics IRD L Laboratory



Their research aims to improve knowledge of the mechanical behavior (in terms of life span), of materials and structures in the naval, automotive and aeronautical fields.

This laboratory is composed of researchers from two universities (Université de Bretagne Occidentale, Brest; Université Bretagne Sud, Lorient) and two graduate schools of engineering (ENSTA Bretagne and ENIB), comprising more than 280 collaborators.

IT Lab-Sticc laboratory



The Lab-STICC is a multidisciplinary research laboratory in the field of Information and communication science and technology. Researchers work in a single structure on one core theme: "from sensor to knowledge".

The Lab-STICC is a research unit of the French national center for scientific research (CNRS) involving two universities (Université de Bretagne Occidentale, Brest; Université Bretagne Sud, Lorient) and three graduate schools of engineering (Telecom Bretagne, ENSTA Bretagne and ENIB). Lab-STICC incorporates more than 560 people.

Human & Social Sciences CRF Laboratory



At ENSTA Bretagne, this department regroups the different disciplines from the field of human and social sciences which are oriented towards the training of engineers in the Humanities : Management, Marketing, Languages, Sport etc

The Researchers of ENSTA Bretagne are active in the Centre de Recherche sur la Formation (Training Research Center) of the CNAM (EA 1410) with teams from the CNAM, Centrale Paris and the Universities of Evry-Val-d'Essonne and UPMC.

Main research themes

- **Assemblies:** development, characterization and modeling of techniques to assemble materials of different natures
- **Structures, fluids and interaction:** behavior of materials and structures interacting with their environment and or their manufacturing process
- **Durability:** the diagnosis, measurement, modeling and prediction of the health of materials, structures and electromechanical systems.

- **Communication, Algorithms, Circuits and Systems (CACS) :** software, model, signal and circuit engineering
- **Knowledge, Information Decision (KID);** Remote sensing, inversion, merging, data retrieval; robotics, positioning; sonar signal processing, active and passive acoustics.
- **Microwaves, Optoelectronics and Materials (MOM) :**Physical modeling, electromagnetic wave propagation

- **Training engineers (educational policies and pedagogical means)**
- **Professional identities of engineers and their environments**

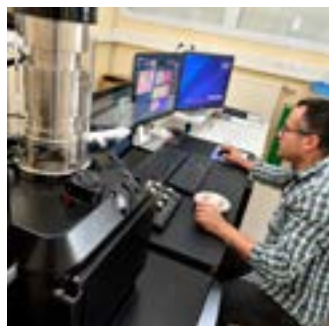
The Institute is at the heart of active networks engaged in higher education, research and industry: "GIS Europé Mer", "Université de Bretagne Loire (UBL)", «France Énergies Marines" (RME), "B-Com" (IT), "Pôle Mer Bretagne Atlantique" (Sea), "iD4CAR" (Automotive Industry), "Images et Réseaux" (Command, Control, Communications and Intelligence), "EMC2" (Mechanical Engineering).

Turnover research 2017: 8 M€

Research staff: 215 including 110 doctoral students

Joint laboratories:

- WAVES, with Thales in autonomous naval robotics and sensor networks
- SPARTE, with iXBlue, In underwater acoustics
- Gustave Zédé, with Naval Group, in material fatigue and naval structures
- in Pyromechanism with Centigon



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> CONTACTS

Director

pascal.pinot
@ensta-bretagne.fr
Phone +33 (0)2 98 34 88 14

Deputy Director

bruno.gruselle
@ensta-bretagne.fr
Phone +33 (0)2 98 34 88 14

Dean for Research

yann.doutreleau
@ensta-bretagne.fr
Phone +33 (0)2 98 34 87 38

Dean of Faculty

helene.klucik
@ensta-bretagne.fr
Phone +33 (0)2 98 34 87 54

Development and External Relations

helene.guillamot
@ensta-bretagne.fr
Phone +33 (0)2 98 34 88 35

Public Relations

ingrid.le_toutouze
@ensta-bretagne.fr
Phone +33 (0)2 98 34 88 51

International Officer

eliane.fonseca
@ensta-bretagne.fr
Phone +33 (0)2 98 34 89 01

Coordinator International Master and Continuing Education Programs

zacharie.malicoutis
@ensta-bretagne.fr
Phone +33 (0)2 98 34 89 74



5,000 graduates

840 engineer and MSc students

110 PhD students

82% destined for high-tech civil industries,

18% destined for the French Military Procurement Agency (DGA)



20% are international students and PhDs

ENSTA Bretagne École Nationale Supérieure de Techniques Avancées Bretagne

2 rue François Verny - 29806 Brest cedex 9 - France
Tél. +33 (0)2 98 34 88 00 - contact@ensta-bretagne.fr

www.ensta-bretagne.eu

