

IN FIGURES

- **2.4 million jobs** depend on mathematics, 9% of total employment in France
- **15%** of gross domestic product
- **4,000** research faculty in mathematics
- **60** mathematics research labs
- **14 Fields medals** earned by mathematicians from French math labs
- **4 Abel prizes** to French mathematicians
- **3rd in the world** for math publications; math accounts for 7% of French scholarly publications
- **6,600 students** enrolled in master's programs in math, 2,000 in doctoral programs (2013)

INTERNATIONAL

French mathematics has a worldwide reputation for excellence. Measured in terms of Fields medals, the prestigious prize conferred by the International Mathematical Union at the quadrennial International Congress of Mathematicians, more than a fifth of the awards made over time have gone to French mathematicians. France is always represented at the congress by a large contingent of invited lecturers, attesting to the high quality of the nation's mathematical endeavor.

The international reach of French mathematics is furthered by a tradition of cooperation with less-developed countries through the International Center for Pure and Applied Mathematics (CIMPA), based in Nice and recognized by UNESCO. CIMPA is an international center that works to promote mathematics in developing countries.

RELATED FIELDS

- Aerospace • Astronomy • Biology • Biotechnology • Chemistry
- Computer science • Digital technologies • Ecology • Economics
- Electronics • Engineering • Environment • Geography • Geosciences
- Humanities • Life sciences • Management • Mechanics
- Pharmacology • Physics • Space sciences

SUBFIELDS

- Accounting • Algebra • Algorithms • Applied mathematics
- Arithmetic • Automation • Banking • Calculus • Digital calculus
- Demography • Epidemiology • Equations • Finance • Genetics
- Geometry • Nuclear engineering • Number theory • Probability
- Robotics • Statistics • Theorems

USEFUL LINKS

- ◆ **AMIES, Agency for Mathematics Interactions with Business and Society:** www.agence-maths-entreprises.fr
- ◆ **ARDM: Association for Research in the teaching of Mathematics:** www.ardm.eu
- ◆ **CIPAM, International Center for Pure and Applied Mathematics:** <https://www.cimpa.info>
- ◆ **CFEM, French Commission on Mathematics Teaching:** www.cfem.asso.fr
- ◆ **Directory of the French mathematics community:** <http://annuaire.emath.fr>
- ◆ **Directory of math laboratories and research units:** <https://www.portail-math.fr/laboratoires>
- ◆ **E-math.fr, France's math domain:** www.emath.fr
- ◆ **CM, International Congress of Mathematicians:** www.mathunion.org
- ◆ **IMUC, International Mathematical Union:** www.mathunion.org
- ◆ **M4TH portal for the higher education math community:** <https://www.portail-math.fr>
- ◆ **SMAI, Society for Applied and Industrial Mathematics:** <http://smai.emath.fr>
- ◆ **SFDs, French Statistical Society:** www.sfds.asso.fr
- ◆ **Why study math?** <http://smf.emath.fr/les/plaquette-metiers-maths.pdf>

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MATHEMATICS

Since the 16th century, French mathematicians have made important contributions to the discipline. Among the many prestigious names renowned in the mathematical world are François Viète from the 16th century; René Descartes, Blaise Pascal, Pierre de Fermat, and Girard Desargues from the 17th; Jean d'Alembert, Joseph Louis Lagrange, Adrien-Marie Legendre, and Joseph Fourier from the 18th; Évariste Galois, Augustin-Louis Cauchy, Joseph Liouville, and Henri Poincaré from the 19th; Jacques Hadamard, André Weil, Jean Leray, Laurent Schwartz, and Jean-Pierre Serre from the 20th; and Laurent Laforgue, Jacques Tits, Mikhaïl Leonidovich (Franco-Russian), Cédric Villani, and Artur Ávila (Franco-Brazilian) in the 21st.

France remains one of the "great powers" in mathematics alongside the United States, Russia, and Great Britain. Its international influence can be measured in terms of the high-level recognition (Fields medals, Wolf prizes, Crafoord prizes, etc.) that its mathematicians receive and by the frequency with which they are invited to lecture.

Mathematics plays a role in a large number of economic sectors and spills over into many other academic disciplines and programs taught in the French system of higher education, including engineering education. All applications of mathematics are represented in specialized master's programs and doctoral programs in physics, electronics, computer science, chemistry, and biology, with specializations in statistics, engineering, manufacturing, and other areas.

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MATHEMATICS

LICENCE (BACHELOR)

LEVEL

DIPLÔME UNIVERSITAIRE (DU) (BACCALAURÉAT + 1 YEAR OF POSTSECONDARY STUDY) – L1

Students can earn a DU for a year spent preparing for further study in mathematics or physics. The program is offered by the Faculty of Science and Technology at the University of Lorraine:

<http://fst.univ-lorraine.fr>

CLASSE PRÉPARATOIRE AUX GRANDES ÉCOLES (CPGE) (BACCALAURÉAT + 2 YEARS OF POSTSECONDARY STUDY) – L2

Two-year programs of preparation in physics and math (in anticipation of the entrance examinations to grandes écoles of engineering) are offered in French high schools. Students may elect options in computer science or industrial sciences.

LICENCE (BACCALAURÉAT + 3 YEARS OF POSTSECONDARY STUDY) – L3

In some 60 universities, students pursuing the general licence in science, technology, and health can major in mathematics or mathematics and computer science. Another available major is mathematics and computer science for the humanities and social sciences.

The general Licence in law, economics, and management can be pursued with a major in mathematics and computer science applied to economics or to the humanities and social sciences.

MASTER

LEVEL

MASTER (SECONDARY DIPLOMA +5 YEARS OF HIGHER EDUCATION) – M2

The Master in science, technology, and health offers students the choice of many concentrations and specializations—among them applied mathematics and computer science; mathematics and its interactions; basic and applied mathematics; applied mathematics and statistics; mathematics and computer science; mathematics, computer science, and cryptological applications; currency, banking, finance, and insurance (with specialization in financial engineering and modeling); mathematical engineering and computer tools; and actuarial science.

Other Master's degree tracks offer concentrations in mathematics:

- > Master in engineering sciences, concentration in applied mathematics and information sciences
- > Master in environmental and life sciences and technologies, concentration in mathematics and modeling for economics and the social sciences
- > Master in law, economics, management, and social sciences, concentrations in mathematics and computer sciences applied to the humanities and social sciences, and in mathematics, computer sciences, decision making, and organization.

Schools of engineering offer a Master in engineering sciences with a concentration in applied mathematics and several specializations—among them information sciences and synthetic and systemic biology and design and management of complex computer systems. The environmental and life sciences track in the field of agriculture and agronomy includes a concentration in mathematics and modeling for economics and the social sciences with a specialization in comparative development dynamics.

www.campusfrance.org >What program are you looking for ? > Postgraduate level

The national Master's portal: www.trouvermonmaster.gouv.fr

Ten or so programs in applied mathematics are taught in English and lead either to the French national Master or its equivalent: Mathematical Imaging and Spatial Pattern Analysis ; Theoretical and Mathematical Physics Particle and Astrophysics ; Modelling and Mathematical methods in Economics and Finance ; Algorithmics, symbolic computation and numeral ; Biomathematics and computer modeling ; Financial Mathematics.

<http://taughtie.campusfrance.org/tiesearch>

DIPLÔME D'INGÉNIEUR / TITRE D'INGÉNIEUR EQUIVALENT TO MASTER

(BACCALAURÉAT +5 YEARS OF POSTSECONDARY STUDY) – M2

France's schools of engineering deliver diplomas accredited by CTI, the commission on engineering degrees, that are equivalent to the Master and confer the title of engineer. The schools:

- > *École d'ingénieurs en génie des systèmes industriels* - La Rochelle
- > *École nationale supérieure d'électricité et de mécanique de l'Université de Lorraine*, specialization in digital systems - Nancy
- > *École nationale supérieure d'électronique, informatique, télécommunications, mathématique et mécanique* - Bordeaux INP
- > *École nationale supérieure d'informatique pour l'industrie et l'entreprise*
- > *École nationale supérieure d'ingénieurs de Caen*, specialization in computer science
- > *École nationale de la statistique et de l'administration économique*
- > *École nationale de la statistique et de l'analyse de l'information*
- > *École nationale supérieure d'électronique, informatique, télécommunications, mathématiques et mécanique* - Bordeaux INP
- > *École nationale supérieure d'informatique et de mathématiques appliquées* - Grenoble INP
- > *École polytechnique de l'Université Clermont Auvergne*, specialization in mathematical engineering and modeling
- > *École polytechnique universitaire de l'Université Lille I*
- > *École polytechnique universitaire de l'Université Lyon I*, specialization in applied mathematics
- > *École polytechnique universitaire de l'Université de Nice*
- > *École polytechnique universitaire de l'Université Paris VI*, specialization in computer science and applied mathematics
- > *École polytechnique universitaire de l'Université de Tours*
- > *Institut d'informatique d'Auvergne de l'Université Clermont Auvergne*
- > *Institut national des sciences appliquées* in Rouen and Toulouse, specializations in mathematical engineering and applied mathematics
- > *Télécom ParisTech* and *Télécom Sud Paris de l'Institut Mines-Télécom*
- *Université Paris XIII*, applied mathematics and scientific computing

www.cti-commission.fr