FCT LEADING ROLE
Engineering & Sciences

ANTICIPATING THE FUTURE

- 1975/76 Computer Science and Informatics
- 1977/78 Environmental Engineering I Industrial Production Engineering
- 1981/82 Physics and Materials Engineering
- 2009/10 Micro and Nanotechnologies Engineering
- 2015/16 7969 Students

7969 Students
### STUDY CYCLES

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Cycle (Licenciatura)</td>
<td>6</td>
</tr>
<tr>
<td>2nd Cycle (Master)</td>
<td>28</td>
</tr>
<tr>
<td>Integrated Master</td>
<td>11</td>
</tr>
<tr>
<td>3rd Cycle (Doctoral Programmes)</td>
<td>35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>80</strong></td>
</tr>
</tbody>
</table>

### STUDENTS

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candidates / Vacancy</td>
<td>5</td>
</tr>
<tr>
<td>Enrollment per academic year</td>
<td>1110</td>
</tr>
<tr>
<td>Bachelors (Licenciatura)</td>
<td>1014</td>
</tr>
<tr>
<td>Masters</td>
<td>6390</td>
</tr>
<tr>
<td>PhD</td>
<td>565</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7969</strong></td>
</tr>
</tbody>
</table>

### STAFF

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>431</td>
</tr>
<tr>
<td>Non Faculty</td>
<td>206</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>637</td>
</tr>
</tbody>
</table>

### DEPARTMENTS

- Applied Social Sciences
- Chemistry
- Civil Engineering
- Conservation and Restoration
- Earth Sciences
- Electrical Engineering
- Environmental Sciences and Engineering
- Informatics
- Life Sciences
- Materials Science
- Mathematics
- Mechanical and Industrial Engineering
- Physics
- Science and Technology of Biomass
- Science and Technology of Biomass

### BUDGET

- State funding, 10^4€: 23,7
- Tuition fees, 10^4€: 8,5
- **Total budget, 10^4€: 45.1**
• R&D PROJECTS 2016

(\% funding)

ONGOING
(2016)
730

EU
40\%

NATIONAL
44\%

OTHERS
16\%

RUNNING BUDGET
€15.3 MILLION

• PUBLICATIONS
(2011 – 2015)

ISI WoS
5509

• PHD THESIS
(2011-2015)

289
• FUNDING (2011-2015)

COMPETITIVE INTERNATIONAL PROJECTS
€33,2M

COMPETITIVE NATIONAL PROJECTS
€55,5M

PRIVATE FUNDING
€25,4M

• R&D UNITS

12 CENTERS
4 UNITS

ERC GRANTS
5

RESEARCHERS
525 Integrated Members
565 PhD Students

16 RESEARCH & DEVELOPMENT UNITS

3 EXCEPTIONAL

4 EXCELLENT

6 VERY GOOD

3 GOOD

• MADAN PARK OF SCIENCE

52 PATENTS

84 START-UPS / SPIN-OFFS
(2000-2010)

TOTAL TURNOVER
€40M

INVESTMENT R&D
€10M

JOBS
500

3RD WORLD BEST SCIENCE BASED INCUBATOR 2011
EXCELLENCE IN RESEARCH

• PARTICIPATION IN US - PORTUGAL | PROGRAMMES

BIOENGINEERING SYSTEMS
(MIT - Massachusetts Institute of Technology/UNL)

MATHEMATICS
(CMU - Carnegie Mellon University/UNL)

DIGITAL MEDIA + ADVANCED COMPUTING + MATHEMATICS
(UTA - University of Texas at Austin/UNL)

• RESEARCH HIGHLIGHTS | 2014/15 ERC GRANTS

TRANSPARENT ELECTRONICS
Imagine having a fully transparent and flexible, foldable, low cost, displays or at the glass window of your home/office, a transparent electronic circuit. We develop thin film transistors for a broad range of applications. This ERC AdG grant was the first one given to Portugal.

HOW NOSE SENSORS ARE BEING USED TO FIGHT ANTIMICROBIAL RESISTANCE
Development of bioinspired nose sensors for identification of bacterial infections, decreasing microbial detection and identification from hours to seconds.

CONVERTING THERMAL AND PHOTONICS ENERGY INTO ELECTRICAL ENERGY
Gather, in a single substrate, solar cells, thermoelectrics and capacitor, to transform the natural heat and light in the environment into electricity, and to store it.

PAPER ELECTRONICS
Sustainable, fully recyclable and low cost electronic systems are still far from being a reality. New-Fun project is focused in the development of eco-friendly and bio-inspired functional inorganic/hybrid materials and printing processes able to result in a new class of low cost, recyclable/disposable paper based electronics devices.
FCT NOVA R&D UNITS

- CEFITEC
  Center of Physics and Technological Research
- CENSE
  Center for Environmental and Sustainability Research
- CIUHCT
  Interuniversity Center for the History of Science and Technology
- CMA
  Center for Mathematics and Applications
- CTS
  Center of Technology and Systems
- I3N
  Institute of Nanostructures, Nanomodelling and Nanofabrication
- LIBPhys
  Laboratory for Instrumentation, Biomedical Engineering and Radiation Physics
- NOVA LINCS
  NOVA laboratory for Computer Science and Informatics
- LAQV
  Associated Laboratory for Green Chemistry
- UCIBIO
  Applied Molecular Biosciences Unit
- UNIDEMI
  Research and Development Unit in Mechanical and Industrial Engineering
- VICARTE
  Glass and Ceramic for the Arts
- CEFAGE
  Center for Advanced Studies in Management and Economics
- GeoBioTec
  GeoBioSciences, GeoTechnologies and GeoEngineering
- MARE
  Marine and Environmental Sciences Center
- MEtRiCs
  Mechanical Engineering and Resource Sustainability Center
CEFITEC is a research centre of FCT, Universidade NOVA de Lisboa bringing together researchers on the forefront of Physical Engineering, Applied Physics, Physics, Technological Physics and Biophysical sciences. Research within CEFITEC focuses on scientific and technological developments on Surface Science and Vacuum Technology, Atomic and Molecular Interactions, Thin Films production, Solar Pumping Laser and Functional Molecular Systems. We approach these fundamental and applied areas of science by applying unique analytical and technical approaches with complementary techniques and facilities within an international environment. Currently we keep collaborations with universities/research units in Spain, France, UK, Belgium, Austria, Denmark, Poland, Morocco, Algeria, Brazil, Japan and Australia.
**CENSE** is a research unit of FCT NOVA, which mission is to carry out interdisciplinary research in environmental sciences and engineering, on the interaction between human and natural systems, to promote sustainable development. We are 24 integrated members, organized in two research groups (Sustainability Engineering | Ecological Economics and Environmental Management), doing long term, cutting edge interdisciplinary research (Support scientific assessments and policy processes | Develop new approaches | Find innovative solutions | Implement environmental monitoring and information systems). CENSE is integrated in networks of research activities worldwide, and participates in five PhD programmes (Environment and Sustainability | Global Studies | E-planning | Climate Change and Sustainable Policies | Digital Media UTAustin-Portugal). We want to attract young scientists, fostering the impact of our research both in the scientific community and in society.
CIUHCT is as a leading European research unit in the field of social studies in Science, Technology and Medicine (STM). Using a multi-disciplinary approach and mainly Portuguese case studies, it aims at unveiling the importance of STM in the construction of the Europe. CIUHCT considers its mission to assess contemporary issues through the STM lenses, using history and material culture as basis for policy-making, and as a showcase for European citizenship and identity building. CIUHCT participates in international research projects, networks and innovative pedagogical platforms and it is a hub for a new generation of scholars, hosting 20 post-doctoral and 15 PhD students. CIUHCT’s organization is based in two transversal thematic groups:

- Instruments and Practices, Visual and Material Cultures addresses how scientific and technical practices interact with material culture
- Experts, Institutions and Globalization address the role of experts and institutions in a growing global world.
The CMA (Centre for Mathematics and its Applications) is a research unit of the New University of Lisbon, which develops, promotes and funds research in various areas of pure and applied mathematics. It was established in 1993 as a result of the expansion of the Statistics, Numerical Analysis and Optimization Centre. Currently CMA has more than 70 integrated members, divided into four research groups (Algebra and Logic, Analysis, Statistics and Risk Management and Operations Research). To be an integrated member of the center it is necessary to maintain a particular level of scientific publications in international journals indexed with peer review. The CMA is associated with national and international doctoral programs. In the last assessment made by the Foundation for Science and Technology, CMA received a rating of "Very Good".
The mission of CTS is to perform fundamental and applied research, provide advanced education and training, disseminate knowledge, and stimulate technology transfer in major domains of electrical and computer engineering. CTS is organized according to 3 Thematic Lines (TLs): TL A focuses on micro/nano-electronics, signal processing and embedded systems; TL B is devoted to the application of electronics and electrical sciences for enhancement of industrial processes and energy efficiency; TL C is devoted to computer engineering, spanning from collaborative networks, interoperability and decision-based systems. CTS envision developing a full-fledged Electrical Engineering and Computer Science area of excellence, spanning from Cyber-Physical systems to Energy-Efficient systems, at UNINOVA Institute and at the Department of Electrical Engineering of the Faculty of Sciences and technology Campus of Nova University of Lisbon.
CENIMAT | i3N

INSTITUTE OF NANOSTRUCTURES, NANOMODELLING AND NANOFABRICATION

CENIMAT | i3N is a national scientific research center sponsored by the Ministry of Science, Technology and Higher Education through the Foundation for Science and Technology of Portugal. Since 2006 integrates the Institute for Nanostructures, Nanomodelling and Nanofabrication (i3N). CENIMAT | i3N is devoted to develop radically new eco-sustainable approaches by exploiting the inorganic, hybrid and organic materials’ multifunctionalities and their mechanical, physical and chemical properties for multi-sectorial applications, involving Nanofabrication and Micro/Nanotechnologies tools, well supported by modeling activities.

CENIMAT | i3N has a strong record in the production of scientific results of high international quality, materialized in publications with high impact factor. Moreover, its cooperation with industry and its mindset towards applied things and innovation makes it to secure a high number of patents and so, being in an excellent position to stimulate existing knowledge to promote the creation/generation of start-ups based on the frontiers of new applied concepts able to satisfy the demands of comfort of end-users: the people!

CENIMAT | i3N has demonstrated over the last years and excellent attractiveness for European funded projects, going from ideas (3 ERC grants) to innovative applications, (> 25), demonstrating a good potential of financial independence, considered an international reference in the area of Materials Science and Nanotechnologies.
The LIBPhys - UNL is one of the three groups of the new research unit LIBPhys (Laboratory for Instrumentation, Biomedical Engineering and Radiation Physics). The R&D activities of LIBPhys-UNL are developed in the areas of atomic, molecular, nuclear physics and electronic & industrial automation instrumentation with applications to analytical methods, radiation detection, biomedical engineering. The LIBPhys-UNL is committed to an active and strong knowledge transfer not only to the scientific community but also to the society, from the pure scientific contribution to the general knowledge to the involvement in spinoffs companies and in the development of equipment. Broad domains:

- The Fundamental Parameters and Metrology
- The Cryogenic, Electronics and Radiation Detection
- Instrumentation
- The Analytical Techniques Development and Application
- The Biomedical Engineering
NOVA LINCS is a leading research unit in the area of Computer Science and Informatics Engineering, hosted at the Departamento de Informática of Faculdade de Ciências e Tecnologia of Universidade NOVA de Lisboa (FCT NOVA), a pioneering national institution in the field. The mission of NOVA LINCS is to develop cutting edge scientific research in key areas of Computer Science and Informatics, contribute to advanced education in the field, and share the produced knowledge, results, and innovation with users and communities within society. Our current long term scientific program is guided by the theme “Principles and Engineering for Global Software Systems”, and builds on our solid portfolio of past research achievements, on our ability to appropriately balance fundamental research on principles and methodologies with research on applications and innovation, on our expertise in broad areas of computer science, and on thriving interactions with external technology and knowledge users.
REQUIMTE is a science-driven institution focused on the development of Sustainable Chemistry. The 15 year experience of sharing complementary scientific knowledge between researchers of the Universities of Porto and NOVA of Lisbon led to significant advances in focusing expertise in Chemistry and Chemical Engineering in the development of sustainable products and processes. REQUIMTE’s mission is to cooperate in a continuous, competent and efficient way to achieve a Sustainable development by promoting new technologies that aim to reduce or even eliminate undesirable substances in the design, production and uses of Chemicals.

FCT and ESF have carried out an international evaluation of Portuguese scientific R&D Units, where REQUIMTE has been classified as Excellent and considered by the evaluation panel as an excellent multidisciplinary and highly productive research unit.
The Applied Molecular Biosciences Research Unit, UCIBIO, synergistically brings together top researchers in Biomolecular Sciences from University of Porto and FCT NOVA of Lisbon. UCIBIO combines key expertise in Chemistry and Biological Sciences with an ambitious strategic plan to maximize both national and international impact in terms of scientific productivity, advanced training and translation to society. Within the national context, UCIBIO key strength lies on its broad scope of fundamental and applied research standing at the interface of Chemistry and Biology to address pertinent questions at atomic, molecular, sub-cellular and cellular levels, including cell-to-cell interactions and population evolutionary dynamics. In 2013, the European Science Foundation lead evaluation of R&D Units, rated UCIBIO with the highest mark (Exceptional). It was considered by the evaluators as a top performing Unit in Portugal (top 3%) and ranked as one of the 3 top performers in Biomolecular Sciences.
UNIDEMI

RESEARCH AND DEVELOPMENT UNIT IN MECHANICAL AND INDUSTRIAL ENGINEERING

The UNIDEMI (Unidade de Investigação e Desenvolvimento em Engenharia Mecânica e Industrial) is a research centre of Universidade NOVA de Lisboa that aims to achieve world class Excellence in research, development and entrepreneurial results in the scientific areas of Mechanical Engineering and Industrial Engineering and Management. UNIDEMI structure has 3 research groups: Systems Engineering and Management (SEM) that focus on themes of industrial systems design, engineering and management; Manufacturing and Technology Automation (MTA) has a focus on advanced manufacturing processes oriented to laser welding, friction stir processing, composites machining and non-destructive testing; and Fluid and Structures Engineering (FSE), with a focus on areas of fluid-structure interaction, related to efficient energy production and its utilization, and design of coastal structures and reliability of marine structures. Over the years, UNIDEMI has developed strong links with leading international academic partners and national industrial companies.
VICARTE
VIDRO E CERÂMICA
PARA AS ARTES

The Research Unit VICARTE – Vidro e Cerâmica para as Artes (Glass and Ceramic for the Arts) is devoted to the promotion of transdisciplinary research applied to glass and ceramics, focusing on the intersections between art and science, and stimulating the sharing of knowledge, experiences and methodologies between these two areas. The research at VICARTE connects the present and the past, by developing new materials for glass and ceramics contemporary art, by studying the traditional and historical production practices and the exploring different aesthetical concepts in art. We are committed to uphold and surpass VICARTE’s reputation as a center of excellence that encourages cross-disciplinary research, creativity and innovation in glass and ceramic science applied to art, design and cultural heritage. VICARTE is currently a reference name in glass and ceramics archaeometry in our country, responsible for pioneering studies.
The Center for Advanced Studies in Management and Economics of the U. of Évora was created in 2006, with the aim of promoting research in Management and Economics. In 2013, CEFAGE-UE established scientific branches at U. do Algarve, U. da Beira Interior and FCT/UNL. CEFAGE-UE is divided into four research groups: "Industrial Economics and Business Strategy", "Econometrics, Statistics and Operations Research", "Finance" and "Labor, Regional and Macroeconomics".

Considering current research interests, in the period 2015/2020, CEFAGE research is organized along the eleven thematic strands. Integrated members and collaborators at FCT/UNL conduct research on the following thematic strands: Capital Structure, Investment Decisions and Firm Performance; Regulation and Competition Policy; Entrepreneurship, Innovation and Industry Dynamics; International Monetary Economics and Integration.

GEObiOTec

GEObiosciences, Geotechnologies and GeoenGINEERING

GEObiOTec is a research partnership between the Aveiro University (UA, general coordination) and the Universities of NOVA de Lisboa (FCT NOVA) and Beira Interior. GeoBioTec develop interdisciplinary studies in geophysics, geochemistry, biology, soil, petrology, mineralogy, industrial minerals, geo materials, geotechnics, isotopic geology, hydrogeology, structural geology, volcanology and remote sensing. It integrates 101 researchers and 65 collaborators and is organized in five research groups, three with researchers from FCT NOVA:

- Georesources, Geotechnics and Geomaterials (3G) – geological and geotechnical mapping, modelling and geostatistics, prospection, exploitation and processing of geomaterials, risk analysis
- Sedimentary Basins and Paleontology – sedimentology, tectonics, biostratigraphy, evolution, global changes, geological heritage (FCT NOVA coordination)
- Agro-Forestry – biofortification, phytoremediation, production and transformation of raw materials (FCT NOVA coordination)
MARE - NOVA constitutes a Unit of MARE - Marine and Environmental Sciences Centre for research, technological development and innovation. Its mission is to seek excellence in the study of environment and disseminate knowledge to support policies for sustainable development. This mission is achieved through scientific research, education and knowledge and technology transfer to industry, as well as through the dissemination of science, establishing collaborative networks at the regional, national and international levels. It was established in 2013. MARE-NOVA has 18 integrated members, working mainly in four research thematic lines: Environmental assessment and ecological risk, Policy and governance, Ecology, behaviour and conservation and Hydraulics, water resources and environment, being the coordinator of the these first two lines. Its main research projects address the issues: Environmental toxicology & biotechnology, Microplastics and marine litter, Governance and Wastes management.
METRICS is a research centre in association, bringing together researchers of Escola de Engenharia-Universidade do Minho and Faculdade de Ciências e Tecnologia-Universidade NOVA de Lisboa, on the forefront of Mechanical, Materials and Biomedical Engineering, Energy and Bioenergy and Food Quality. The research activities focuses on scientific and technological developments on advanced engineering design of mechatronic systems for health support, green mobility systems, conversion of renewable resources in biomaterials, bioliquids and biofuels, sustainable agriculture and forestry, food security and quality and recycling of biomass wastes. The centre activities are also embedded in the Centre for Residue Valorisation (CVR) and the Network for Bioenergy (CEBio). The centre cooperates with SMEs, European countries, emerging economies and developing countries for fostering industrial innovation and competitiveness.
FCT NOVA DEGREES

UNDERGRADUATE PROGRAMMES | 1st Cycle
- Cell and Molecular Biology
- Biochemistry
- Conservation - Restoration
- Geological Engineering
- Mathematics
- Applied Chemistry

MASTER DEGREES | 2nd Cycle
- Glass Art and Science
- Bioenergy
- Biochemistry
- Biochemistry for Health
- Biotechnology
- Gastronomical Sciences
- Conservation and Restoration
- Systems Dynamics (European Master)
- Education
- Civil Engineering – Building Rehabilitation
- Civil Engineering - Structures and Geotechnics
- Renewable Energy Engineering
- Membrane Engineering (EM3E) (Erasmus Mundus)
- Water Management and Engineering
- Geological Engineering
- Mathematics Education
- Nutritional Phytotechnology for Human Health
- Molecular Genetics and Biomedicine
- Environmental Management and Policy
- Computational Logic
- Mathematics and Applications
- Mathematics for Teachers
- Medical Microbiology

INTEGRATED MASTER | 2nd Cycle
- Biomedical Engineering
- Civil Engineering
- Environmental Engineering
- Materials Engineering
- Industrial Engineering and Management
- Electrical and Computer Engineering
- Physics Engineering
- Computer Science and Engineering
- Mechanical Engineering
- Micro and Nanotechnologies Engineering
- Chemical and Biochemical Engineering
PHD PROGRAMMES | 3rd Cycle
• Environment and Sustainability
• Technology Assessment
• Bioenergy
• Biology
• Biochemistry
• Biotechnology
• Chemistry
• Science and Materials Engineering
• Educational Sciences
• Biomedical Engineering
• Civil Engineering
• Membrane Engineering (EUDIME) (Erasmus Mundus)
• Electrical and Computer Engineering
• Physics Engineering
• Geological Engineering
• Industrial Engineering
• Mechanical Engineering
• Chemical and Biochemical Engineering

PHD PROGRAMMES FINANCED BY FC&T | 3rd Cycle
• Climate Change and Sustainable Development Policies

• Molecular BioSciences
• Bioengineering (MIT)
• Radiation Biology and Biophysics
• Catalysis and Sustainability
• Conservation and Restoration of Cultural Heritage
• Eco-efficient Construction and Rehabilitation
• Biomedical Engineering: NOVA Instrumentation for Health
• Engineering of Refining, Petrochemistry and Chemistry
• Globalization Studies
• Applied and Engineering Physics
• International Neuroscience Doctoral Programme

POSTGRADUATE PROGRAMMES
• Bioenergy
• Hands-on Course - From Proteomics to Proteins
• Technology and Food Quality
• Agro-Industrial Production and Processing Technologies

ADVANCED STUDIES PROGRAMMES
• Bioengineering (MIT)
• Geological Engineering for Construction in Urban Environment
• Engineering of Refining, Petrochemistry and Chemistry
• Sanitary Engineering and Integrated Waste Management
PIONEERING PEDAGOGICAL EXPERIENCE

• COMPLEMENTARY COMPETENCES

1ST SEMESTER

YEAR 1ST
TRANSVERSAL COMPETENCES FOR SCIENCE AND TECHNOLOGY
Curricular Planning; CV preparation; Time management; Team work;
Leadership; Advanced use of Excel; Communication in science and technology;
Bibliography; Ethics; Deontology.

YEAR 2ND
SCIENCE, TECHNOLOGY AND SOCIETY
For a better understanding of the technical and scientific world

YEAR 3RD
UNDERGRADUATE RESEARCH PROGRAM OR UNDERGRADUATE PRACTICE PROGRAM
Engage students in scientific R&D projects, or hands-on activities in partner companies

YEAR 4TH
ENTREPRENEURSHIP
Promote students’ entrepreneurial vocation for turning ideas into value
Basic competences on business plans development

YEAR 5TH
MASTER THESIS

2ND SEMESTER

• ACADEMIC CALENDAR

SEPTEMBER 1ST SEMESTER
JANUARY
FEBRUARY 2ND SEMESTER
JUNE
FREE JULY
EUROPEAN DISTINCTIONS

• Blaise Pascal Medal European Academy of Sciences (EURASC) in the area of Materials Science was awarded to E. Fortunato (2016).

• Japan Society for the Promotion of Science (JSPS), attributed to P. Limão-Vieira within the Program “Invitation Fellowship for Research in Japan” (2016).

• Award Professorship by University of Sichuan to V. Machado (2015).

• 1st Prize “Future Ideas” Future Health attributed to P. Ferreira and P. Medeiros (2015)


• Clara Immerwahr Award, attributed to T. Santos-Silva (2014)

• Freeman prize, European Association for the Study of Science and Technology (EASST), M.P. Diogo (2014).
NATIONAL DISTINCTIONS

- Exame Informática Magazine awards the work TETRASOLAR by R. Martins, E. Fortunato and H. Águas (2016).

- Portuguese Young Chemists Award attributed to C. Crucho (2016).


- IBM Award attributed to M. Knorr (2015).


- Santander Totta/Universidade Nova de Lisboa Collaborative Research Award, attributed to, V. Debut (FCSH-UNL) and R. Silva (FCT-UNL) (2015).


- EDP Internet of Things Challenge Award attributed to the team led by A. Grilo and J. Martins (2014).


- Young Research Award from Fundação Calouste Gulbenkian, attributed to T. Monteiro (2014).