

Professional tracks in Biological Engineering

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► Scope:

Over the past 20 years IST has offered Professional Engineer (pre-Bologna *Licenciado*, 5 year cycle, 2002-2006) and Integrated Master Degrees (post-Bologna, 3+2 year cycles, 2007-present) in **Biological Engineering**. In the 2002-2015 period, 186 Engineer degrees and 355 Master degrees were awarded to a total of 554 graduates. An overview of the professional track of a representative number of these graduates (~70%) is presented here.

► Methodology:

The network LinkedIn was the source of information on the professional track of 388 graduates (data from June 2016). The survey covers at least 55% of the students graduating in each class from 2002 through 2015 (Fig. 1).

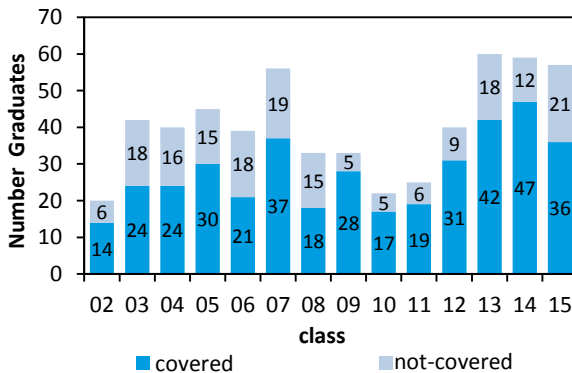


Figure 1. Bachelor and Master degrees in Biological Engineering awarded by IST. The present survey covers ~70% of graduates and at least 50% across all classes.

► Post-graduate training

A significant number of Biological Engineering graduates (148, ~40%) went on to obtain doctoral degrees from Universities in Portugal (53%) and abroad (47%) (Fig. 2).

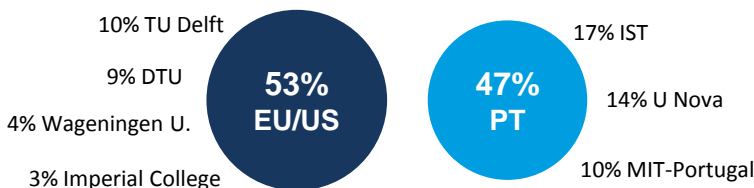


Figure 2. Biological Engineering graduates pursuing doctoral studies abroad and in Portugal.

► About IST:

- **Foundation:** 1911
- **Location:** Lisbon
- **Budget (2015):** ~110 ME
- **Facilities:** 124 323 m²
- **Faculty:** 853
- **Administrative staff:** 475
- **Students:** 11 458
- **1st cycle courses:** 19
- **Master programs:** 28
- **PhD programs:** 32
- **Research centers:** 29
- **Web:** tecnico.ulisboa.pt

► Biological Eng. Graduates:

- **Time frame:** 2002-2015
- **Engineer degrees:** 186
- **Master degrees:** 355
- **Graduates:** 554*
- **Present survey:** 388

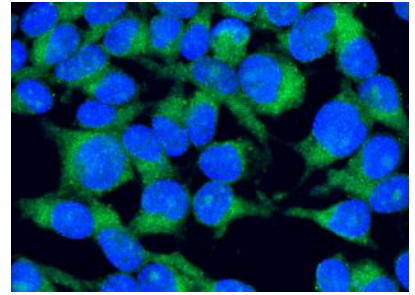
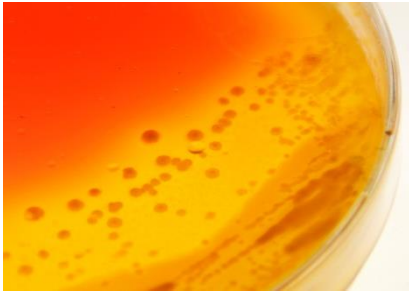
*17 students obtained double degrees

► Top Schools chosen for PhD:

- Portugal**
- U Lisbon
 - U Nova
- Abroad**
- TU Delft, NL
 - DTU, DK
 - Wageningen, NL
 - Imperial College, UK
 - U Leiden, NL
 - U College, UK

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Geographical distribution:

One third of the graduates in Biological Engineering are working abroad, mainly in European Union countries (Fig. 3).



Figure 3. Geographical distribution of Biological Engineering graduate employment.

Graduates in industry:

Biological Engineering graduates who pursue jobs in industry are working mainly for Pharmaceutical, Consulting, Agro-Food and Biotechnology companies (Fig. 4).

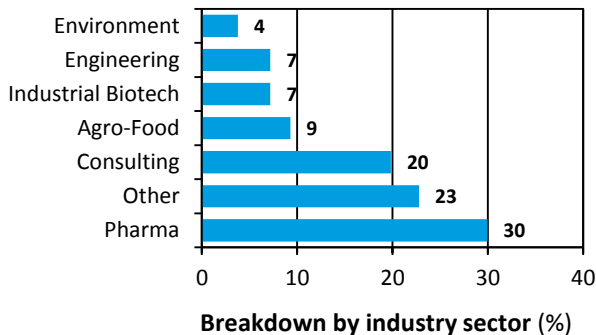


Figure 4. Distribution of Biological Engineering graduates across industry sectors.

About the MSc in Biological Engineering:

The MSc in Biological Engineering requires completion of 300 ECTS (10 semesters). At the end of the 1st cycle (6 semesters), students complete their core training, obtaining a Diploma in Biological Engineering Sciences. The specialized training offered on the 2nd cycle leads to the MSc Degree.

«The course structure and the good majority of the faculty indeed did excel my expectations. Today, working for a biotechnology company abroad, I feel that I'm playing par with anyone in the field and for that I am also grateful to acknowledge the input of my biological/chemical engineering background.»

Tiago Vicente, IST Alumni
International Product Manager
Octapharma, Lachen, CH

Key Employers:

- Hovione
- Accenture
- Hikma
- 4Tune Engineering
- A4F
- Everis
- GenIBET
- Novartis
- Deloitte
- Biosurfit
- Biotrend
- BNP Paribas
- Corbion
- Jerónimo Martins
- Philip Morris
- Covance
- Heineken
- Nestlé
- Sumol-Compal

Biological Eng. at IST:

- **Basic Sciences:** Algebra, Calculus, Statistics, Computer Science, Physics, Biology, Chemistry (Physical, Organic, Analytical), Biochemistry.
- **Engineering Sciences:** Transport Phenomena, Thermodynamics, Process Eng., Reaction Eng., Separation Eng.
- **Speciality Sciences:** Microbiology, Microbial Physiology, Genetic Eng., Genomics, Bioinformatics, Enzyme Eng., Bioreactors, Bioseparations, Environmental Eng., Bioprocess Integration.
- **Transversal skills:** Management, Entrepreneurship & Innovation.