Nb

Bachelor / Nanobiology

Nanobiology uses the language of mathematics in the context of physics to understand the complexity of biology.

The field of Nanobiology is developing fast, bringing changes that will soon have an impact on our society in medicine and beyond. During this degree programme you will cross the boundaries of physics, nanophysics, biology and medical research. You will study at the frontier of an exciting new research field that combines physics and biology.

TU Delft Erasmus

Admission requirements
VWO N&T with BIO N&G with WI B and Physics or international equivalent

Language
English

Numerus Fixus
Yes. 120 first year students

Binding Study Advice
Percentage of students who get a positive BSA
70%

Average study week
Lectures: 10-15 hours
Self-study: 15-20 hours
Projects / practicals: 10 hours

What is Nanobiology?

Education
The Nanobiology Bachelor's degree programme teaches the fundamental knowledge and skills needed to describe and study the complexity of living systems. The emphasis of the programme is on learning to apply quantitative analysis based on the principles of physics using a wide range of tools. This Bachelor's degree programme blends bioscience and engineering approaches, as TU Delft and Erasmus University Rotterdam have joined forces to bring you this unique programme.
The three-year Nanobiology programme is fundamentally interdisciplinary: it gives a thorough grounding in physics and mathematics, focusing on biomedical science and nanoscience. The courses feature lectures, workgroups and hands on learning. It also includes laboratory work which provide an opportunity to work with advanced research equipment. You study in small groups at both Erasmus MC in Rotterdam and the faculty of Applied Sciences at TU Delft.

Research
Nanobiology is a new field of research that integrates physics and biology. The programme focuses on the interactions between molecules, cells and organisms, based on fundamental principles of physics. It can be applied in areas such as: developing methods and techniques for the identification of heart failure before it leads to disease, developing microscopes that help analyse molecules in living cells, analysing complex images and developing computational models. The skills and knowledge from Nanobiology will bring about changes that will affect our society in the near future, not only in terms of medicine, but also in terms of energy, food and beyond.

20%
Mathematics

20%
Physics

20%
Biology

40%
Integrated courses

Bachelor / Nanobiology

What do you learn?

In the Nanobiology programme, students study in Delft and in Rotterdam. Normally students visit one university per day.

Year one: introduction to the field

The first year of Nanobiology will give you a strong foundation in theoretical knowledge and enable you to master basic research skills, laboratory techniques and scientific methods. In the first period you will follow the course on 'Introduction to studying Nanobiology', in which you will develop study and group research skills. Over the year you will take courses in cell biology, advanced mathematics, calculus, linear algebra, physics, biophysics, genetics and biochemistry. You will be introduced to computer programming for the simulation of biological systems, which will provide a basis for advanced programming courses.

Year two: in-depth study of the field

In the second year, you apply the fundamentals of mathematics and biology that you acquired in the first year to advanced mathematics, physics and biology. Throughout the second year these disciplines will be more and more combined in integrated courses. Second-year practical courses include Electronic Instrumentation, Microscopy/Nanoscopy practice and Computational Science.

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Year three: elective space and graduation

In your third and final year of the Bachelor's in Nanobiology, you focus on doing laboratory research while applying all of the knowledge and skills you acquired in the first two years of study. As part of your studies, you follow a 'minor' – a short study project in a scientific field of your choice. In the second half of the third year, you take a selection of elective courses and you start working on your Bachelor's research project. This entails working in a research group for 20 weeks, conducting research that you design together under the direct guidance of an experienced researcher. The results of your research project form the basis for your Bachelor's thesis, which is a scientific report on your research findings.

40%
will continue with the Master programme

25%
international students

50%
female

50%
male

Joint degree
Delft University of Technology Faculty of Applied Sciences (TU Delft) & Erasmus University Rotterdam (Erasmus MC)

What is the profile of a NB student?
- Aptitude for mathematics, physics, biology
- Curiosity about intracellular processes
- Desire to contribute to Biomedicine

Follow-on Master's programmes
- Nanobiology, joint at TU Delft, Erasmus MC
- Research Masters, Erasmus MC
- Biomedical Engineering, TU Delft
- Applied Physics, TU Delft
- Science Education & Communication, TU Delft
- Many International Masters programmes

What are you able to do when you're done?
- Integrate information from multiple disciplines and sources
- Perform experimental research to answer questions in the field of biomedicine
- Apply interdisciplinary knowledge to solve complex problems
- Communicate your answers.

Job prospects
- Pursue a scientific career and continue with a Master and then PhD
- Work in industry, science or government
- A great foundation for a career in teaching, science journalism, advising

Smallest Challenges Nanobiology Greatest Solutions

Find us on Social Media @tudelft_eur_bsc_nanobiology

tudelft.nl/bsc/nb