The successful application of Nanobiology will require not simply collaboration between disciplines, but true disciplinary integration of physics and biology.

In the field of Life Sciences, biology and physics are converging. Traditionally, the level of the cell is the domain of biologists and medical researchers. However, physical processes are at work as well on the cell level. Knowledge of physics (on the nano scale) is essential for a good understanding of these processes, knowledge that biologists and medical researchers typically do not possess. Alternatively, physicists are not acquainted with the behaviour of cells and as a result are not able to interpret physical processes in the cell. To be able to understand the molecular basis of health and disease, knowledge of both physics and (molecular) biology is essential. Nanobiology is the discipline where biology, specifically the basic biology of human health and disease, and nanophysics meet.

The Nanobiology programme of TU Delft and Erasmus MC builds on extensive existing bottom up research collaborations and cooperative mission organizations like Medical Delta. The molecular building blocks of living organisms are the focus and current advances in the nanotechnology toolkit enable the precise visualization, study and control of these biological molecules. Developments in biomedicine, such as studies on human genome variation and the control of stem cells, increasingly require analysis and quantitative description at the fundamental level. Furthermore, it is becoming possible to use the elements of the cell to develop artificial biomolecules and nanoparticles with wide applications in research and medicine. The incorporation of new biological building blocks is highly promising for instance in industrial biotechnology and medical science. These advances will reshape many aspects of medical diagnosis and treatment. The rapid advancement of modern biomedical, biophysical and computational technologies promises to provide new tools to gain in depth knowledge of the fundamental molecular and cellular mechanisms controlling health or involved in disease.
**Programme**
The programme is a mixture of more theoretical courses, which deepen and broaden the knowledge and understanding the students have acquired previously during the bachelor’s program and practical research in a large research project.

The courses continue in the same line as the bachelor courses when it comes to the integration of physics and biology.

Where biological challenges for example in the course “biology of cancer” are being approached from a mathematical and physical perspective.

Other mandatory courses will focus on microscopy in “high resolution imaging” and modeling of complex systems. Apart from the compulsory courses, there is a large selection possibility from a list of elective courses.

Career Prospects
The career prospects of Nanobiology graduates are excellent. The programme prepares for a career in industry, research organizations and public institutions. Graduates can find jobs in fundamental as well as applied research, for instance in life sciences or pharmaceutical companies or chemical companies. Another type of function would be in the development of nano measuring methods and manufacturing technologies.

Admission requirements and application procedures
BSc degree from a Dutch university
In most cases, if you hold a BSc degree and the Master’s degree programme is closely related to your Bachelor’s degree programme, you will be admitted directly into the programme. However, if the Master’s programme is not a direct extension of your undergraduate programme, you will be required to take additional courses in a ‘bridging programme’. This may be a standard programme, or it may be customised to suit your particular situation.

To explore the Master’s degree programmes for which you will be qualified upon completion of your Bachelor’s degree from a Dutch university, go to www.doorstroommatrix.nl

The application process is conducted through Studielink www.tudelft.studielink.nl

Degree from a Dutch university of Applied Sciences (Dutch HBO)
A Bachelor’s degree from a university of Applied Sciences does not qualify you for direct admission to a Master’s degree programme at TU Delft. The Bachelor’s degree in applied sciences must be completed within the nominal duration of the programme, with a gradewighted average of 75% for all study components.

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**Curriculum Nanobiology**

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<th>First Year</th>
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<tr>
<td>Sep</td>
<td>Oct</td>
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<tr>
<td>Maths for NB (6 EC)</td>
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<tr>
<td>Computational Modeling and Dynamic Systems (3 EC)</td>
<td>Biology of Cancer (4 EC)</td>
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<tr>
<td>High Resolution Imaging (4 EC)</td>
<td>Engineering Genetic Information (3 EC)</td>
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<td>Internship (18 EC)</td>
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<tr>
<td>Sep</td>
<td>Oct</td>
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<tr>
<td>Research project (44 EC)</td>
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<td>Proj. Proposal writing (2 EC)</td>
<td>Research present (2 EC)</td>
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<td>Seminars (4 EC)</td>
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<td>Literature review project (4 EC)</td>
<td>Electives (4 EC)</td>
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**Programme**
Nanobiology is a relatively young, fascinating research field combining Physics and Biology. It addresses fundamental mechanisms relevant for health and disease at the level of cells and molecules. The Nanobiology Master Programme offers advanced theoretical and practical courses, preparing students for a PhD trajectory or research position in Nanobiology or related research fields such as technology and life sciences. One of the courses we will teach is Structural Biology. This course explores the relation between structure and function of biological.

Macromolecules such as proteins and nucleic acids and how their interactions enable life. In addition to the theoretical background, computer assignments will provide hands-on experience with protein structure analysis. Recent developments in this field are for example enabling rapid advances in molecular medicine. Nanobiology is a specialist area in rapid development. For students with an interest in natural sciences, biology and medicine, Nanobiology offers the opportunity to contribute to ground-breaking research of the future.

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**Integration of Physics and Biology**
The bachelor courses when it comes to the practical courses, preparing students for a PhD trajectory or research position in Nanobiology.

Where biological challenges for example in the course “biology of cancer” are being approached from a mathematical and physical perspective.

Career Prospects
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In order to start the Master’s degree programme in Nanobiology, you first need to complete a supplementary programme in order to bring your knowledge to the required level. Bridging programmes for the MSc programme are always customised, and they can be completed either during or after your studies at the faculty of Applied Sciences. Entrance examinations in Mathematics and English must be taken before the start of the programme (or the bridging programme). For additional details, see www.hbodoorstrom.tudelft.nl www.tudelft.studielink.nl

International applicants
International applicants must meet the general admission requirements of TU Delft.

1. A BSc degree (or a proof that you have nearly completed a BSc programme) in Nanobiology or closely related to Nanobiology, including extensive course work in Maths, Physics and Biology.
2. A BSc Cumulative Grade Point Average (CGPA) of at least 75% of the scale maximum.
3. A score of at least 90 on the TOEFL (internet-based test) and a minimum of 21 for each section. Or an IELTS with an overall Band score of at least 6.5 and a minimum of 6.0 for each section. Or proof that you have passed the University of Cambridge ‘Certificate of Proficiency in English’ with a minimum grade B or the University of Cambridge ‘Certificate in Advanced English’.

For international students, the application period starts on 1 October and closes on 1 April. To start an MSc application, complete the online application and pay the refundable application fee of € 100. Next, you will receive an email with the link to upload the required documents. Please note that you should apply early, before December 1, if you wish to apply for a scholarship as well. www.admissions.tudelft.nl

Further information
Please visit the webpage for all details, along with a full list of requirements, deadlines and contact
www.admissions.tudelft.nl
www.nb.msc.tudelft.nl
www.eur.nl/english/master/programmes/nanobiology

Serge Donkers
Programme Coordinator
T +31 (15) 27 87991
E Info-MSc-NB@tudelft.nl

Further information for international applicants
International Office
Ms. Tamara Bacsik,
International Recruitment Officer
T +31 (0)15 27 88180
E msc-tnw@tudelft.nl

Faculty of Applied Sciences
Lorentzweg 1
2628 CJ Delft

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