If asphalt could be designed so that it repaired itself, all that inconvenience and congestion that results from road repair would be a thing of the past. And if lighter materials could replace the current metals in auto bodies at an affordable price, far less fuel would be required to get from point A to point B. Those challenges are the sort that materials engineers and materials scientists confront every day in their work.

Materials Science & Engineering is concerned with the development of materials that meet and exceed performance expectations for specific functions. It is also concerned with the manufacturing processes that convert basic materials into final engineered products and the design of innovative new materials for the continuously evolving needs of society.

The MSc Programme in Materials Science & Engineering combines studies of the physical, chemical and mechanical properties of materials with the training in production techniques and the selection of appropriate materials for a wide range of applications.

In the programme, you will gain an understanding of the behaviour of materials under different conditions and learn how to assess their suitability in products and industrial processes. You will study the design of new material properties at nano and micro levels to suit applications on a macro scale. The programme focuses in particular on the design of new materials, including, for example, self healing materials. Covering subjects from atoms to applications and from design to disposal, the Materials Science & Engineering programme is well suited to meet the expectations of students with a more theoretical background and those with backgrounds in applied science or engineering.

Programme

The programme starts with core courses offering a firm grounding in Materials Science. Subsequently students choose a specialisation, which is a consistent set of courses focusing on a particular topic. This can be either one of the predefined specialisations, which may also include an internship, or students can choose to compose their own specialisation. Finally students undertake a literature study and an independent scientific investigation leading to a master’s thesis.
Specialisations

• Materials in Engineering Applications (MEA)
The focus is on the usage of materials in applications and structures by paying attention to processing, joining, selection and failure of materials. An obligatory internship is part of this specialisation.

• Metals Science and Technology (MST)
Attention is paid to the design and performance of metallic microstructures by considering aspects like phase transformations, strengthening mechanisms and processing and by studying computational materials science and corrosion science.

• Materials for Sustainable Development (MSD)
The emphasis is on materials engineering in the context of sustainable resources (materials and energy) and environmental impact. Concepts such as clean energy technologies, high temperature performance and recycling of materials are discussed.

• Advanced Construction Materials: Roads & Buildings (ACM)
This specialisation focuses on civil engineering and infrastructure industries and allows materials science MSc students to study modelling and experimental aspects of advanced construction materials in depth.

Examples of graduation projects
• Welding aluminium alloys without causing residual stresses or distortion;
• Development of self-healing coatings for turbine blades;
• Recycling neodymium-magnet scrap;
• Thermomechanical fatigue of SiMo cast iron used in truck engines.

Career prospects
Tata steel, Allseas, Stork, DAF, Bosch and Philips are just a few of the companies where graduates in Materials Science & Engineering have found positions. They are working in materials production, development and research in the industrial sector, or as materials experts in high level consultancy and management positions. Many work at steel and aluminium production firms. Others have more unusual positions – in archaeology, for example, of authenticating works of art on behalf of museums. Still others are employed in higher education and research, the polymer and recycling industries, patent offices, and industries involved in the development of high-tech micro devices for applications in biomedical prostheses.

Curriculum Materials Science & Engineering

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<tr>
<th>First Year</th>
<th>2nd semester</th>
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<tbody>
<tr>
<td>1st semester</td>
<td>2nd semester</td>
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<tr>
<td>Structure &amp; Properties (8 EC)</td>
<td>Functional Ceramics (3 EC)</td>
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<tr>
<td>Ethics and Engineering (3 EC)</td>
<td>Computational Materials Science (3 EC)</td>
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<tr>
<td>Characterisation of Materials (6 EC)</td>
<td>Mechanical Behaviour of Materials (4 EC)</td>
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<tr>
<td>Society’s Needs (3 EC)</td>
<td>Processing of Materials (3 EC)</td>
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<tr>
<td>Metals Science (4 EC)</td>
<td>Obligatory / elective specialisation courses (19 EC)</td>
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<tr>
<td>Polymer Science (4 EC)</td>
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<table>
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<tr>
<th>Second Year</th>
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<tr>
<td>Obligatory / elective specialisation courses (20 EC)</td>
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<td>or</td>
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<tr>
<td>Internship (15 EC)</td>
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<tr>
<td>Obligatory / elective specialisation courses (5 EC)</td>
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<tr>
<td>Master Thesis Project (40 EC)</td>
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</table>

1 EC = 28 hrs study, according to the European Credit Transfer System (ECTS)
Total number of credits in the MSc programme = 120 EC

For more information on all courses please visit: [www.studyguide.tudelft.nl](http://www.studyguide.tudelft.nl)
Admission requirements and application procedure

**Dutch BSc degree**

In most cases, if you hold a BSc degree and the Master’s programme is closely related to your Bachelor’s programme, you will be admitted directly into the programme. However, if the Master’s programme does not follow directly from your undergraduate programme, you will be required to take additional courses in what is called a bridging programme. This may be a standard programme, or it may be tailored to your specific situation.

To see which Master’s programmes are open to you on completion of your Bachelor’s degree Dutch university, go to www.doorstroommatrix.nl.

Application goes through Studielink: www.tudelft.studielink.nl

**Dutch HBO degree**

An HBO Bachelor’s degree does not qualify you for direct admission to a TU Delft Master’s degree programme. To start a Master’s degree programme, you will first need to complete a supplementary programme in order to bring your knowledge to the required level. You can do this during your HBO programme by completing a bridging or by means of a bridging programme after securing your HBO diploma.

Entrance requirements for mathematics and English (some exceptions) apply for both the bridging minor and the bridging programme. See www.hbodoorstroom.tudelft.nl for detailed information.

Application goes through Studielink: www.tudelft.studielink.nl

**International applicants**

To be considered for admission to a MSc Programme you’ll need to meet TU Delft’s general admission requirements.

1. A BSc degree (or a proof that you have nearly completed a BSc programme) in a field closely related to the MSc programme.
2. A BSc Cumulative Grade Point Average (CGPA) of at least 75% of the scale maximum.
3. Proof of English language proficiency:
   - TOEFL (Test of English as a Foreign Language) with a minimum score of 21 for each section and an overall band score of at least 90 (internet-based test). Please note that we only accept the TOEFL internet-based test.
   - or IELTS (academic version) with a minimum score 6.0 for each section and an overall Band score of at least 6.5.
   - or proof that you have passed the University of Cambridge ‘Certificate in Advanced English’ with a minimum grade B or the University of Cambridge ‘Certificate of Proficiency in English’.

For international students, the application period starts in October and closes on 1 April. To start an MSc application, fill in the online application and pay the refundable application fee of €100. Then send hard copies of the application documents to TU Delft’s International Office. Please note that you should apply early when you want to be considered for a scholarship as well!

For more information about the application procedure and studying at TU Delft in general, go to: www.admissions.tudelft.nl.

Further information

Please visit the webpage for all details, complete requirements, deadlines and contact information:
www.mse.msc.tudelft.nl

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