MSc in Sustainable Energy

Official title

Civilingeniør, cand. polyt. (Bæredygtig Energi)
Master of Science in Engineering (Sustainable Energy)

About the Programme Specification

This programme specification revised by 1 September 2018 applies for all students enrolled in the programme.

Students enrolled from 1 September 2018 will find their curriculum in the paragraph "Curriculum".

Students enrolled prior to 1 September 2018 may find additional information to the curriculum in the paragraph "Curriculum, previous admission years."

The programme specification also includes the course descriptions in DTU's course database, which states rules pertaining to both the programme specific and eligible courses in the programme.
The programme specifications are laid down by DTU in accordance with Ministerial Order on Bachelor and Master’s (Candidatus) Programmes at Universities No. 1520 of December 16th 2013, with subsequent amendments, Ministerial Order on the International Education Activities of Universities No. 247 of March 13th 2015 and Ministerial Order on the Grading Scale and Other Forms of Assessment of Study Programmes Offered under the Ministry of Higher Education and Science (the Grading Scale Order) No. 114 of February 3rd 2015. In accordance with DTU’s regulations section 11.8 the curricula have been approved by the Dean of Graduate Studies, authorized by the President.

Duration

The Master of Science in Engineering programme is a 2-year programme equivalent to 120 ECTS point (European Credit Transfer System).

Specific rules apply for the Corporate MSc Eng Programmes in Civil Engineering plus Computer Science and Engineering. These programmes combine work with studies and are part-time studies where the 120 ECTS points are obtained over a 4-year period.

General admission requirements

Only applicants holding either a relevant Bachelor of Science in Engineering, a Bachelor in Engineering or a Bachelor of Natural Science degree can be admitted to a Master of Science in Engineering programme. The bachelor degree must be less than 10 years old.

The individual MSc Eng programme states in detail which bachelor programmes qualify and whether applicants have to complete supplementary educational activities.

Requirements for supplementary educational activities can equate to up to 30 ECTS credits and are specified in the form of a list of courses under the individual MSc Eng programmes.

The specific requirements must be met before graduating from the bachelor programme or in connection with conditional admission to a particular MSc Eng programme. The courses must be passed prior to the commencement of studies within one year from the conditional admission.

Supplementary educational activities in connection with conditional admission to an MSc Eng programme do not form part of the MSc Eng programme, and partial tuition fees are charged. If the supplementary courses have not been passed within the deadlines specified, the conditional admission to the programme is withdrawn.
The Master of Science in Engineering programmes are offered in English. Therefore applicants must demonstrate proficiency in English (B-level, IELTS, TOEFL- or Pearson test).

DTU offers Honours Programme as part of all MSc Eng. programmes. The admission requirements are described at [http://www.dtu.dk/english/education/msc/honours-programmes](http://www.dtu.dk/english/education/msc/honours-programmes)

**Academic requirements for this programme**

The admission requirements for this programme are specific for each study line and all students are admitted in just one line

**Line specific admission requirements:**

**Bio energy:**

The following Bachelor of Science in Engineering programmes from DTU have access to the study line Biofuels of the MSc Eng programme in Sustainable Energy:

- Biotechnology Engineering
- Chemistry and Technology
- Mechanical Engineering
- Environmental Engineering

The following Bachelor of Engineering programmes from DTU have access to the study line Biofuels of the MSc Eng programme in Sustainable Energy:

- Mechanical Engineering with energy specialisation
- Chemical and Bio Engineering

For B.Sc. and B.Eng programmes with access to the study line the students have to have completed the following DTU courses or similar:

- 01035 Advanced Engineering Mathematics 2  
- 01037 Advanced Engineering Mathematics 2  
- 02405 Probability theory  
- 02601 Introduction to Numerical Algorithms  
- 42101 Introduction to Operations Research  
- 41401 Fundamentals of Engineering Thermodynamics  
- 12143 Bioresources

Bachelor of Science in Engineering, Bachelor of Natural Science and Bachelor of Engineering from other universities with qualifications equivalent to the relevant Bachelor of Science in Engineering from DTU have access to the study line Biofuels of the MSc Eng programme in Sustainable Energy

**Electric energy systems:**
The following Bachelor of Science in Engineering programmes from DTU entitle students to the study line Electric Energy Systems of the MSc Eng programme in Sustainable Energy:

- Electrical Engineering

The following Bachelor of Science in Engineering programmes from DTU have access to the study line Electric Energy Systems of the MSc Eng programme in Sustainable Energy:

- Strategical Analysis and Systems Design
- General Engineering, Future Energy

The following Bachelor of Engineering programmes from DTU have access to the study line Electric Energy Systems of the MSc Eng programme in Sustainable Energy:

- Electrical Engineering
- Electrical Energy Technology

For B.Sc. and B.Eng programmes with access to the study line the students have to have completed the following DTU courses or similar:

- 01035 Advanced Engineering Mathematics 2 or 01037 Advanced Engineering Mathematics 2 or 02405 Probability theory or 02601 Introduction to Numerical Algorithms or 11305 Comp. Struct. Modelling 1: Finite Element Meth. or 42101 Introduction to Operations Research
- 31001 Electric circuits 1
- 31400 Electromagnetics or 31730 - Electric Power Engineering, fundamentals

Bachelors of Science in Engineering, Bachelors of Natural Science and Bachelor of Engineering from other universities with qualifications equivalent to the relevant Bachelors of Science in Engineering from DTU

**Energy conversion and storage:**

The following Bachelor of Science in Engineering programmes from DTU entitle students to the study line Hydrogen and fuel cells of the MSc Eng programme in Sustainable Energy:

- General Engineering (Cyber Materials and Future Energy)
- Physics and Nanotechnology
- Chemistry and Technology

Bachelors of Science in Engineering, Bachelors of Natural Science and Bachelor of Engineering from other universities with qualifications equivalent to the relevant Bachelors of Science in Engineering from DTU

**Energy savings:**
The following Bachelor of Science in Engineering programmes from DTU entitle students to the study line Energy Savings of the MSc Eng programme in Sustainable Energy:

- Architectural Engineering
- Civil engineering

The following Bachelor of Science in Engineering programmes from DTU have access to the study line Energy Savings of the MSc Eng programme in Sustainable Energy:

- Strategical Analysis Systems Design Engineering
- Design and innovation

The following Bachelor of Engineering programmes from DTU have access to the study line Energy Savings of the MSc Eng programme in Sustainable Energy:

- Civil Engineering
- Architectural Engineering

For B.Sc. and B.Eng programmes with access to the study line the students have to have completed the following DTU courses or similar:

- 01035 Advanced Engineering Mathematics 2 or 01037 Advanced Engineering Mathematics 2
- 02405 Probability theory or 02601 Introduction to Numerical Algorithms or 11305 Comp. Struct. Modelling 1: Finite Element Meth.
- 42101 Introduction to Operations Research
- 11112 Technical Building Services 1
- 11121 - Thermal Building Physics

Bachelors of Science in Engineering, Bachelors of Natural Science and Bachelor of Engineering from other universities with qualifications equivalent to the relevant Bachelors of Science in Engineering from DTU

Energy systems analysis:

The following Bachelor of Science in Engineering programmes from DTU entitle students to the study line Energy systems analysis of the MSc Eng programme in Sustainable Energy:

- Strategic analysis and systems design
- Mathematics and Technology
- General Engineering (Future energy)
- Mechanical Engineering
The following Bachelor of Engineering programmes from DTU have access to the study line Energy systems analysis of the MSc Eng programme in Sustainable Energy:

- Civil Engineering
- Design & Innovation
- Traffic and Transportation

For B.Sc. and B.Eng programmes with access to the study line the students have to have completed the following DTU course or similar:

- 01035 Advanced Engineering Mathematics 2 or 01037 Advanced Engineering Mathematics 2
  or 02405 Probability theory or 02601 Introduction to Numerical Algorithms or 11305 Comp. Struct. Modelling 1: Finite Element Meth.
- 42101 Introduction to Operations Research or 02526 Mathematical Modeling

- 02402 Introduction to Statistics or 02403 Introduction to Mathematical Statistics or 02405 Probability theory or 02105 Algorithms and Data Structures 1
- 42005 Micro and macroeconomics or 42415 Engineering Economy

Bachelors of Science in Engineering, Bachelors of Natural Science and Bachelor of Engineering from other universities with qualifications equivalent to the relevant Bachelors of Science in Engineering from DTU have access to the study line Energy systems analysis of the MSc Eng programme in Sustainable Energy

**Solar energy:**

Candidates for the specialization within Solar Energy should holds basic skills within thermodynamics, electric circuits and preferably elemental knowledge of semiconductors and construction.

The following Bachelor of Science programmes from DTU entitle students to the study line Solar Energy of the MSc Eng programme in Sustainable Energy:

- Civil Engineering
- Architectural Engineering
- Electrical Engineering

- Physics and Nanotechnology
- General Engineering (Future Energy)
- Mechanical Engineering (Energy)
The following Bachelor of Science in Engineering programmes from DTU have access to the study line Solar Energy of the MSc Eng programme in Sustainable Energy:

- Design and Innovation

The following Bachelor of Engineering programmes from DTU have access to the study line Solar Energy of the MSc Eng programme in Sustainable Energy:

- Civil Engineering
- Design & Innovation
- Electrical Energy Technology
- Electrical Engineering
- Mechanical Engineering

For B.Sc. and B.Eng programmes with access to the study line the students have to have completed as minimum the following DTU courses or similar:

- **01035** Advanced Engineering Mathematics 2 or **01037** Advanced Engineering Mathematics 2
  or **02601** Introduction to Numerical Algorithms or **11305** Comp. Struct. Modelling 1: Finite Element Meth.
- **10024** Physics 1
- **10044** Physics 2

For students with respective interest in Solar Heating, Electronics and Solar Cells it is an advantage to have passed the courses in the following table or similar courses.

- **10260** Physics of solar energy and energy storage-5-point-Semiconductor physics
- **31351** Basic power electronics-5-point-Electronics
- **33253** Micro 1: Solid-state Electronics & Microtechnology-10-point-Semiconductor physics
- **41650** Materials science-5-point-Solar Heating
- **41814** Heat transfer-5-point-Solar Heating

Bachelors of Science in Engineering, Bachelors of Natural Science and Bachelor of Engineering from other universities with qualifications equivalent to the relevant Bachelors of Science in Engineering from DTU have access to the study line Solar Energy of the MSc Eng programme in Sustainable Energy

**Thermal energy:**

The following Bachelor of Science in Engineering programmes from DTU have access to the study line Thermal Energy of the MSc Eng programme in Sustainable Energy:
The following Bachelor of Engineering programmes from DTU have access to the study line Thermal Energy of the MSc Eng programme in Sustainable Energy:

- Mechanical Engineering with energy specialisation

For B.Sc. and B.Eng programmes with access to the study line the students have to have completed the following DTU courses or similar:

- **01035** Advanced Engineering Mathematics 2 or **01037** Advanced Engineering Mathematics 2
- **02405** Probability theory or **02601** Introduction to Numerical Algorithms or **11305** Comp. Struct. Modelling 1: Finite Element Meth. or **42101** Introduction to Operations Research
- **41312** Basic Fluid Mechanics or **41065** Fields and flows or **62657** Fluid Mechanics
- **41401** Fundamentals of Engineering Thermodynamics or **41045** Thermodynamic Modelling

Bachelors of Science in Engineering, Bachelors of Natural Science and Bachelor of Engineering from other universities with qualifications equivalent to those of Bachelors of Science in Engineering from DTU

**Wind energy:**

The following Bachelor of Science in Engineering programmes from DTU entitle students to the study line Wind Energy of the MSc Eng programme in Sustainable Energy:

- Mechanical Engineering
- Electrical Engineering
- Physics and Nanotechnology
- Civil Engineering
- Design and Innovation

The following Bachelor of Engineering programmes from DTU have access to the study line Thermal Energy of the MSc Eng programme in Sustainable Energy:

- Building and Civil Engineering, specialization in Construction Engineering
- Civil and Structural Engineering
- Mechanical Engineering
Electrical and Electronic Engineering
Electrical Power Engineering

For B.Sc. and B.Eng programmes with access to the study line the students have to have completed the following DTU course or similar:

- 01035 Advanced Engineering Mathematics 2 or 01037 Advanced Engineering Mathematics 2
- or 02601 Introduction to Numerical Algorithms or 11305 Comp. Struct. Modelling 1: Finite Element Meth.

Bachelors of Science in Engineering, Bachelors of Natural Science and Bachelor of Engineering from other universities with qualifications equivalent to those of Bachelors of Science in Engineering from DTU

Objectives

The Master of Science in Engineering programme has two central objectives:

- Academic cutting-edge competencies which are the result of a clear study progression and which are unique to the graduate. The academic competencies contain elements of actual research and are manifested in the final master thesis
- Polytechnic holistic competencies that, in addition to an identity-creating professionalism, also include being able to gain an overview of a complex technical problem and being able to think in technical terms in commercial and societal contexts

A MSc in Engineering programme from DTU is a research-based education at the highest technological level, which qualifies the holder to take on knowledge-intensive positions in the business community and society that are distinguished by a high level of scientific development. Moreover, the MSc in Engineering qualification allows the holder to continue his/her education in the field of research (research-based programmes, PhD).

The holder of an MSc in Engineering has the competencies required to analyse, synthesize and evaluate theory and experiments relating to complex and complicated engineering systems, issues and solutions for the benefit of society.

Shared academic goals for learning outcome

Knowledge and understanding
A graduate of the MSc Eng. programme from DTU

- has a solid understanding of and a firm base of knowledge in natural sciences and technological principles, possesses comprehensive knowledge within a given subject area, and is familiar with the current development trends and opportunities within the academic area
- can identify and reflect on technical scientific issues and understand the interaction between the various components of an issue
- can, based on a clear academic profile, apply elements of current research at international level to develop ideas and solve problems
- has insight into and understanding off the internal interaction between the various engineering domains and other competencies in connection with solving specific engineering problems
possesses knowledge about sustainability, innovation and entrepreneurship

Skills
A graduate of the MSc Eng. programme from DTU

- masters technical scientific methodologies, theories and tools, and has the capacity to take a holistic view of and delimit a complex, open issue, put it into a broader academic and societal perspective and, on this basis, propose a variety of possible actions
- can, via analysis and modelling, develop relevant models, systems and processes for solving technological problems
- can communicate and mediate research-based knowledge both orally and in writing
- can discuss technological issues with various types of stakeholder
- is familiar with and can seek out leading international research within his/her specialist area

Competencies
A graduate of the MSc Eng. programme from DTU

- masters technical problem-solving at a high level through project work, and has the capacity to work with and manage all phases of a project – including preparation of timetables, design, solution and documentation
- can work independently and reflect on own learning, academic development and specialization
- can independently combine his/her technological knowledge with knowledge about business, management, organization and project work

The MSc Eng. programme qualifies the graduate to hold positions in the private and public sectors, the consulting industry or to apply for research training with a view to earning a PhD.

Programme specific competence profile
A Master of Science in Engineering (Sustainable Energy)

Structure
The MSc Eng programme is a research-based technological programme at elite level aimed at qualifying the graduate for a knowledge-intensive position in industry and the business sector and in society in general. Graduates obtain the title Master of Science in Engineering in the given engineering field

The MSc Eng has a workload of 120 ECTS credit points. The programmes comprise four categories of courses: General competences, Technology specialization, Electives and Thesis. If students choose more than the required credits in the groups with mandatory courses, the credits count as elective courses.

General Competence Courses
The General Competence Courses have a broader scope than the specialist competencies. The primary purpose is to ensure that a series of competences – in association with the individual specialization – are obtained by all candidates. The following three considerations must be emphasized:

- A generalist point of view, where technology is combined with economics, management, organization and project work, and where the key is to have a technical approach in a commercial and societal perspective
- A synthesis point of view concentrating on working with an open problem where teamwork and cooperation, especially interdisciplinary work, are a key element
- Normative technical skills that formulate a common academic identity for the degree program and/or indicate the academic point of departure and level of the program

The polytechnic holistic competencies that are cited as one of the two central objectives for the MSc program can be obtained in many ways, but the contents of the study program's General Competencies outlined here ensure that the central aspects of these competencies are part of the course of study, depending on how the Technological Specialization and MSc thesis are undertaken.

**Technological Specialization Courses**
The Technological Specialization and MSc Thesis together represent the basic foundation for achieving the academic cutting-edge competencies. The specific courses offered within the Technological Specialization are dynamic and will constantly reflect (potential) technological developments.

**Elective Courses**
The Elective Courses, which include all MSc courses at DTU, provide an opportunity for the graduate student to either focus even more on his/her chosen area of specialization or to supplement the academic specialization with general disciplines/competencies in mathematics, physics, chemistry, biology, programming, economics, management, etc. or with disciplines from associated specializations. The graduate student may choose as much as 10 credit points among the bachelor courses at DTU and courses at an equivalent level from other higher institutions. (The opportunity of choosing basic courses will be written down to the extent that the possibility of getting a credit transfer for courses which fall outside the academic domain of the student's studies is used.)

**Master Thesis**
The Master Thesis is the final project of the course of study. In many cases, it will be possible for the Master Thesis to include collaboration with a company. The Master Thesis must as a minimum equal 30 ECTS credit points, but may be 32½ or 35 ECTS credit points. Please read the chapter “Master Thesis” for more information.

**Study Lines and Focus areas**
Within a MSc programme, there might be one or more study lines. A study line is a suggested combination of courses geared towards a specific aspect of a discipline. The specialization title will - when approved by the head of studies - be added on the diploma.

Focus areas are exclusively descriptive and will not be added on the degree diploma.

**Programme provision**

In order to obtain the MSc degree in Sustainable Energy the student must fulfil the following requirements:
• Have passed General Competence Courses adding up to at least 30 points
• Have passed Technological Specialization Courses adding up to 30 or 35 points depending on study line
• Have completed a Master Thesis of at least 30 points within the field of the chosen study line
• Have passed a sufficient number of Elective Courses to bring the total number of points of the entire study up to 120 points.

Study lines/focus areas

The program covers the following study lines:

- Thermal energy
- Biofuels
- Electric energy systems
- Hydrogen and fuel cells
- Energy savings
- Wind energy

The study lines are described on the [homepage](#).

The Sustainable Energy programme is Climate-KIC accredited and for all lines it is possible to apply for this additional [Climate-KIC track](#).

Curriculum

General competence courses (30 ECTS):

The special MSc programme consists of a total of 30 ECTS general competence courses with the following courses mandatory:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>42002</td>
<td>Modelling and Analysis of Sustainable Energy Systems using Operations Research</td>
<td>5</td>
<td>Autumn E4B (Fri 8-12)</td>
</tr>
<tr>
<td>42003</td>
<td>Energy Economics, Markets and Policies</td>
<td>10</td>
<td>Autumn E2 (Mon 13-17, Thurs 8-12)</td>
</tr>
</tbody>
</table>

Additionally 3 of the following 5 general competence courses must be included:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>10333</td>
<td>Physics of Sustainable Energy</td>
<td>5</td>
<td>Autumn E5B (Wed 13-17)</td>
</tr>
<tr>
<td>28870</td>
<td>Energy and Sustainability</td>
<td>5</td>
<td>Autumn E5B (Wed 13-17)</td>
</tr>
<tr>
<td>42004</td>
<td>Feasibility studies of energy projects</td>
<td>5</td>
<td>Autumn E3A (Tues 8-12)</td>
</tr>
</tbody>
</table>
Students are admitted to a specific study line based on the bachelor study. It is only possible to change study line by fulfilling all prerequisites and by acceptance from the head of studies and the study line responsible person.

- Bio Energy
- Electric Energy Systems
- Energy Conversion and Storage
- Energy Savings
- Energy Systems Analysis
- Solar Energy
- Thermal Energy
- Wind Energy

The prerequisites of each study line are described on the home page of each study line.

Courses within the study line in Bio Energy

Technological Specialization Courses (30 point):

1. Compulsory TS courses (15 point):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>28871</td>
<td>Production of Biofuels</td>
<td>10</td>
</tr>
<tr>
<td>28872</td>
<td>Biorefinery</td>
<td>5</td>
</tr>
</tbody>
</table>

2. Elective TS-courses (15 point):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>27246</td>
<td>Applied enzyme technology and kinetics</td>
<td>5</td>
</tr>
<tr>
<td>27247</td>
<td>Advanced Enzyme Technology</td>
<td>5</td>
</tr>
<tr>
<td>28271</td>
<td>Thermal gasification and sustainability</td>
<td>5</td>
</tr>
<tr>
<td>28345</td>
<td>Industrial BioReaction Engineering</td>
<td>5</td>
</tr>
<tr>
<td>28350</td>
<td>Process Design: Principles and Methods</td>
<td>10</td>
</tr>
<tr>
<td>42372</td>
<td>Life Cycle Assessment of Products and Systems</td>
<td>10</td>
</tr>
</tbody>
</table>
3. Elective Courses (30 point):

10 ECTS must be taken either from the list of courses below or from excess courses from the group
2. Elective TS-courses. The remaining 20 can be used freely for any of the DTU advanced courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>12132</td>
<td>LCA Modelling of Waste Management Systems</td>
<td>5</td>
<td>January</td>
</tr>
<tr>
<td>26510</td>
<td>Catalysis and Sustainable Chemistry</td>
<td>10</td>
<td>Spring F4 (Tues 13-17, Fri 8-12)</td>
</tr>
<tr>
<td>28233</td>
<td>Recovery and purification of biological products</td>
<td>5</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
<tr>
<td>28244</td>
<td>Combustion and High Temperature Processes</td>
<td>5</td>
<td>Autumn E4B (Fri 8-12)</td>
</tr>
<tr>
<td>28434</td>
<td>Membrane Technology</td>
<td>5</td>
<td>Spring F1A (Mon 8-12)</td>
</tr>
<tr>
<td>31778</td>
<td>Distributed energy technologies</td>
<td>5</td>
<td>Spring F1B (Thurs 13-17)</td>
</tr>
<tr>
<td>41343</td>
<td>Fuels and emissions from transportation</td>
<td>5</td>
<td>June</td>
</tr>
<tr>
<td>42375</td>
<td>Advanced system modelling and life cycle inventory analysis</td>
<td>5</td>
<td>Spring F4B (Fri 8-12)</td>
</tr>
<tr>
<td>42435</td>
<td>Knowledge-based Entrepreneurship</td>
<td>5</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
</tbody>
</table>

Courses within the study line in Electric Energy Systems

Technological specialization courses (30 ECTS)

1. Compulsory TS-Courses (15 ECTS):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>31742</td>
<td>Power grid analysis</td>
<td>5</td>
<td>Spring F3A (Tues 8-12)</td>
</tr>
<tr>
<td>31778</td>
<td>Distributed energy technologies</td>
<td>5</td>
<td>Spring F1B (Thurs 13-17)</td>
</tr>
<tr>
<td>31783</td>
<td>Integration of wind power in the power system</td>
<td>5</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
</tbody>
</table>

2. Elective TS-courses (15 ECTS):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>02435</td>
<td>Decision-Making Under Uncertainty</td>
<td>5</td>
<td>Spring F4A (Tues 13-17)</td>
</tr>
<tr>
<td>31070</td>
<td>Hands-on microcontroller programming</td>
<td>5</td>
<td>January</td>
</tr>
<tr>
<td>31372</td>
<td>Modelling for operation of complex industrial plants</td>
<td>5</td>
<td>Spring F5A (Wed 8-12)</td>
</tr>
<tr>
<td>31380</td>
<td>Intelligent systems</td>
<td>10</td>
<td>Autumn E1 (Mon 8-12, Thurs 13-17)</td>
</tr>
<tr>
<td>31730</td>
<td>Electric power engineering, fundamentals</td>
<td>10</td>
<td>Autumn E4 (Tues 13-17, Fri 8-12)</td>
</tr>
<tr>
<td>31745</td>
<td>Computational electric energy systems</td>
<td>5</td>
<td>June</td>
</tr>
<tr>
<td>31750</td>
<td>Stability and control in electric power systems</td>
<td>10</td>
<td>Autumn E5 (Wed 8-17)</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>ECTS</td>
<td>Semester</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------</td>
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</tr>
<tr>
<td>31756</td>
<td>High power electronics</td>
<td>10</td>
<td>Spring F4 (Tues 13-17, Fri 8-12)</td>
</tr>
<tr>
<td>31761</td>
<td>Renewables in electricity markets</td>
<td>5</td>
<td>Spring F2A (Mon 13-17)</td>
</tr>
<tr>
<td>31765</td>
<td>Optimization in modern power systems</td>
<td>5</td>
<td>Autumn E3A (Tues 8-12)</td>
</tr>
<tr>
<td>31770</td>
<td>High voltage engineering</td>
<td>10</td>
<td>Spring F5 (Wed 8-17)</td>
</tr>
<tr>
<td>31773</td>
<td>Transients in power systems</td>
<td>5</td>
<td>Autumn E1B (Thurs 13-17)</td>
</tr>
<tr>
<td>31782</td>
<td>Electrical machines</td>
<td>5</td>
<td>Spring F2A (Mon 13-17)</td>
</tr>
<tr>
<td>31786</td>
<td>Wind Turbine Electrical Design</td>
<td>10</td>
<td>Autumn E2B (Thurs 8-12) and Autumn E3B (Fri 13-17)</td>
</tr>
<tr>
<td>31795</td>
<td>Journal club in electric power and energy</td>
<td>5</td>
<td>Spring F4B (Fri 8-12)</td>
</tr>
<tr>
<td>41416</td>
<td>Energy systems - analysis, design and optimization</td>
<td>10</td>
<td>Spring F5 (Wed 8-17)</td>
</tr>
<tr>
<td>47310</td>
<td>Battery materials and chemistries: from fundamental mechanisms to battery cells</td>
<td>5</td>
<td>Autumn E5B (Wed 13-17)</td>
</tr>
</tbody>
</table>

Courses within the study line in Energy Conversion and Storage

Technological specialization courses (35 points)

1. Compulsory TS-courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>47319</td>
<td>Functional materials</td>
<td>5</td>
<td>Spring F1A (Mon 8-12)</td>
</tr>
</tbody>
</table>

Choose at least 15 ECTS among the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>10304</td>
<td>Experimental Surface Physics</td>
<td>10</td>
<td>Spring F3 (Tues 8-12, Fri 13-17)</td>
</tr>
<tr>
<td>10305</td>
<td>Advanced Solid State Physics</td>
<td>5</td>
<td>Autumn E2B (Thurs 8-12)</td>
</tr>
<tr>
<td>26290</td>
<td>Chemistry at the Nanoscale</td>
<td>5</td>
<td>Autumn E1B (Thurs 13-17)</td>
</tr>
<tr>
<td>26510</td>
<td>Catalysis and Sustainable Chemistry</td>
<td>10</td>
<td>Spring F4 (Tues 13-17, Fri 8-12)</td>
</tr>
</tbody>
</table>

2. Elective TS-courses (15 ECTS):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>10112</td>
<td>Advanced Quantum Mechanics</td>
<td>10</td>
<td>Autumn E2 (Mon 13-17, Thurs 8-12)</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
<td>Semester</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------</td>
<td>---------</td>
<td>----------</td>
</tr>
<tr>
<td>10122</td>
<td>Statistical Physics</td>
<td>5 point</td>
<td>Autumn E3A</td>
</tr>
<tr>
<td>10302</td>
<td>Electronic Structure Methods in Material Physics, Chemistry and Biology</td>
<td>10 point</td>
<td>Spring F5 (Wed 8-17)</td>
</tr>
<tr>
<td>10304</td>
<td>Experimental Surface Physics</td>
<td>10 point</td>
<td>Spring F3 (Tues 8-12, Fri 13-17)</td>
</tr>
<tr>
<td>10305</td>
<td>Advanced Solid State Physics</td>
<td>5 point</td>
<td>Autumn E2B (Thurs 8-12)</td>
</tr>
<tr>
<td>26231</td>
<td>Physical Chemistry 3</td>
<td>5 point</td>
<td>Spring F5B (Wed 13-17)</td>
</tr>
<tr>
<td>26290</td>
<td>Chemistry at the Nanoscale</td>
<td>5 point</td>
<td>Autumn E1B (Thurs 13-17)</td>
</tr>
<tr>
<td>26510</td>
<td>Catalysis and Sustainable Chemistry</td>
<td>10 point</td>
<td>Spring F4 (Tues 13-17, Fri 8-12)</td>
</tr>
<tr>
<td>31778</td>
<td>Distributed energy technologies</td>
<td>5 point</td>
<td>Spring F1B (Thurs 13-17)</td>
</tr>
<tr>
<td>33250</td>
<td>Semiconductor Technology</td>
<td>5 point</td>
<td>Spring F3B (Fri 13-17)</td>
</tr>
<tr>
<td>34540</td>
<td>Light emitting diodes and photovoltaics for energy applications</td>
<td>5 point</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
<tr>
<td>34552</td>
<td>Photovoltaic Systems</td>
<td>5 point</td>
<td>Spring F2B (Thurs 8-12)</td>
</tr>
<tr>
<td>34553</td>
<td>Applied Photovoltaics</td>
<td>5 point</td>
<td>June</td>
</tr>
<tr>
<td>47304</td>
<td>Ceramic science and engineering</td>
<td>10 point</td>
<td>Spring F2 (Mon 13-17, Thurs 8-12)</td>
</tr>
<tr>
<td>47305</td>
<td>Electrochemistry</td>
<td>5 point</td>
<td>Spring F3A (Tues 8-12)</td>
</tr>
<tr>
<td>47310</td>
<td>Battery materials and chemistries: from fundamental mechanisms to battery cells</td>
<td>5 point</td>
<td>Autumn E5B (Wed 13-17)</td>
</tr>
<tr>
<td>47313</td>
<td>Electrochemical devices for a cleaner society: NOx purification, fuel cells and batteries</td>
<td>5 point</td>
<td>June</td>
</tr>
<tr>
<td>47316</td>
<td>Advanced computational tools for energy materials</td>
<td>5 point</td>
<td>Autumn E5A (Wed 8-12)</td>
</tr>
<tr>
<td>47317</td>
<td>Exergy analysis</td>
<td>5 point</td>
<td>Spring F2A (Mon 13-17)</td>
</tr>
<tr>
<td>47330</td>
<td>Energy storage and conversion</td>
<td>5 point</td>
<td>Autumn E1A (Mon 8-12)</td>
</tr>
</tbody>
</table>

3. Elective courses (30 ECTS):
It is possible to choose freely among DTU’s courses including surplus TS-courses. Students participating in the Climate-KIC programme must take 42435

Courses within the study line in Energy Savings

Technological specialization courses (35 ECTS)
1. Compulsory TS-courses:
### 1. Building Energy and Technical Services - Integrated Design (5 points, Autumn E5A)

Choose at least 10 ECTS among the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>11127</td>
<td>Sustainable heating and cooling of buildings</td>
<td>5</td>
<td>Spring F4A (Tues 13-17)</td>
</tr>
<tr>
<td>11129</td>
<td>Sustainable District Heating</td>
<td>5</td>
<td>Spring F1A (Mon 8-12)</td>
</tr>
<tr>
<td>11142</td>
<td>Daylight and lighting</td>
<td>5</td>
<td>Autumn E3B (Fri 13-17)</td>
</tr>
</tbody>
</table>

2. Elective TS-courses (20 ECTS):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>11116</td>
<td>Sustainable Buildings</td>
<td>10</td>
<td>Autumn E2 (Mon 13-17, Thurs 8-12)</td>
</tr>
<tr>
<td>11117</td>
<td>Solar Heating Systems</td>
<td>10</td>
<td>Spring F3 (Tues 8-12, Fri 13-17)</td>
</tr>
<tr>
<td>11124</td>
<td>Computational Fluid Dynamics for Buildings</td>
<td>5</td>
<td>Autumn E5B (Wed 13-17)</td>
</tr>
<tr>
<td>11142</td>
<td>Daylight and lighting</td>
<td>5</td>
<td>Autumn E3B (Fri 13-17)</td>
</tr>
<tr>
<td>11222</td>
<td>Indoor Climate</td>
<td>10</td>
<td>Spring F5 (Wed 8-17)</td>
</tr>
</tbody>
</table>

3. Elective courses (25 ECTS):

10 ECTS must be taken either from the list of courses below or from excess courses from the group 2. Elective TS-courses. The remaining 15 points can be used freely for any of the DTU advanced courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>11121</td>
<td>Thermal Building Physics</td>
<td>5</td>
<td>Spring F1B (Thurs 13-17)</td>
</tr>
<tr>
<td>11122</td>
<td>Heat and mass transfer in buildings</td>
<td>5</td>
<td>Autumn E1B (Thurs 13-17)</td>
</tr>
<tr>
<td>11128</td>
<td>Development of solar energy systems</td>
<td>5</td>
<td>Autumn E4A (Tues 13-17)</td>
</tr>
<tr>
<td>11221</td>
<td>Ventilation and Climatic Systems</td>
<td>10</td>
<td>Autumn E1 (Mon 8-12, Thurs 13-17)</td>
</tr>
<tr>
<td>31761</td>
<td>Renewables in electricity markets</td>
<td>5</td>
<td>Spring F2A (Mon 13-17)</td>
</tr>
<tr>
<td>42259</td>
<td>Facilities Management</td>
<td>5</td>
<td>Autumn E2B (Thurs 8-12)</td>
</tr>
<tr>
<td>42435</td>
<td>Knowledge-based Entrepreneurship</td>
<td>5</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
</tbody>
</table>

3. Elective courses (25 point):

25 points may be taken among all of DTU's courses, including surplus technological specialization courses.

Students also participating in the Climate-KIC programme must take 42435

Following are suggested electives:
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>47311</td>
<td>Analytical imaging of energy materials by electron microscopy</td>
<td>5</td>
<td>Autumn E5A (Wed 8-12)</td>
</tr>
<tr>
<td>47318</td>
<td>Advanced chemistry for non-chemists</td>
<td>5</td>
<td>Autumn E4A (Tues 13-17)</td>
</tr>
<tr>
<td>47323</td>
<td>Advanced plasma processes for tailoring materials and nanostructures</td>
<td>5</td>
<td>June</td>
</tr>
<tr>
<td>47514</td>
<td>Advanced electrochemistry</td>
<td>5</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
</tbody>
</table>

Courses within the study line in Energy systems analysis

**Technological specialization courses (30 points)**

1. Compulsory TS-courses (15 points):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>02435</td>
<td>Decision-Making Under Uncertainty</td>
<td>5</td>
<td>Spring F4A (Tues 13-17)</td>
</tr>
<tr>
<td>31761</td>
<td>Renewables in electricity markets</td>
<td>5</td>
<td>Spring F2A (Mon 13-17)</td>
</tr>
<tr>
<td>42008</td>
<td>Introductory Econometrics</td>
<td>5</td>
<td>Spring F1B (Thurs 13-17)</td>
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</table>

2. Elective TS (15 ECTS):

Choose among the following or excess courses from the group of GC courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Schedule</th>
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</thead>
<tbody>
<tr>
<td>02443</td>
<td>Stochastic Simulation</td>
<td>5</td>
<td>June</td>
</tr>
<tr>
<td>31380</td>
<td>Intelligent systems</td>
<td>10</td>
<td>Autumn E1 (Mon 8-12, Thurs 13-17)</td>
</tr>
<tr>
<td>31742</td>
<td>Power grid analysis</td>
<td>5</td>
<td>Spring F3A (Tues 8-12)</td>
</tr>
<tr>
<td>31778</td>
<td>Distributed energy technologies</td>
<td>5</td>
<td>Spring F1B (Thurs 13-17)</td>
</tr>
<tr>
<td>31783</td>
<td>Integration of wind power in the power system</td>
<td>5</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
<tr>
<td>41416</td>
<td>Energy systems - analysis, design and optimization</td>
<td>10</td>
<td>Spring F5 (Wed 8-17)</td>
</tr>
<tr>
<td>42006</td>
<td>National energy system modelling with TIMES</td>
<td>5</td>
<td>January</td>
</tr>
<tr>
<td>42111</td>
<td>Static and Dynamic Optimization</td>
<td>5</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
<tr>
<td>42112</td>
<td>Mathematical Programming Modelling</td>
<td>5</td>
<td>January</td>
</tr>
<tr>
<td>42116</td>
<td>Implementing OR Solution Methods</td>
<td>5</td>
<td>June</td>
</tr>
<tr>
<td>42123</td>
<td>Optimization in Finance</td>
<td>5</td>
<td>Autumn E2A (Mon 13-17)</td>
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<tr>
<td>42172</td>
<td>Risk and decision-making</td>
<td>5</td>
<td>January</td>
</tr>
<tr>
<td>42180</td>
<td>Quantitative modelling of behaviour</td>
<td>5</td>
<td>Spring F3A (Tues 8-12)</td>
</tr>
</tbody>
</table>
3. Elective courses (30 ECTS):

10 ECTS must be taken either from the list of courses below or from excess courses from the group
2. Elective TS-courses. The remaining 20 point ECTS can be used freely for any of the DTU
advanced courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>02431</td>
<td>Risk Management</td>
<td>5</td>
<td>January</td>
</tr>
<tr>
<td>11129</td>
<td>Sustainable District Heating</td>
<td>5</td>
<td>Spring F1A (Mon 8-12)</td>
</tr>
<tr>
<td>42085</td>
<td>Strategy, design and market</td>
<td>5</td>
<td>Autumn E2B (Thurs 8-12)</td>
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<tr>
<td>42114</td>
<td>Integer Programming</td>
<td>5</td>
<td>Autumn E4A (Tues 13-17)</td>
</tr>
<tr>
<td>42136</td>
<td>Large Scale Optimization using Decomposition</td>
<td>5</td>
<td>Spring F2B (Thurs 8-12)</td>
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<tr>
<td>42178</td>
<td>Transportation system analysis</td>
<td>5</td>
<td>Autumn E5B (Wed 13-17)</td>
</tr>
<tr>
<td>42195</td>
<td>Transport economics</td>
<td>5</td>
<td>F1A (Mon 8-12)</td>
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<tr>
<td>42372</td>
<td>Life Cycle Assessment of Products and Systems</td>
<td>10</td>
<td>Autumn E1 (Mon 8-12, Thurs 13-17)</td>
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<tr>
<td>42375</td>
<td>Advanced system modelling and life cycle inventory analysis</td>
<td>5</td>
<td>Spring F4B (Fri 8-12)</td>
</tr>
<tr>
<td>42429</td>
<td>Project Management</td>
<td>5</td>
<td>August</td>
</tr>
<tr>
<td>42435</td>
<td>Knowledge-based Entrepreneurship</td>
<td>5</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
<tr>
<td>42457</td>
<td>Supply Chain Management</td>
<td>5</td>
<td>Autumn E3A (Tues 8-12)</td>
</tr>
<tr>
<td>46200</td>
<td>Planning and Development of Wind Farms</td>
<td>5</td>
<td>January</td>
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</table>

Courses within the study line Solar Energy

Technological specialization courses (30 ECTS):

1. Compulsory TS-courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>11117</td>
<td>Solar Heating Systems</td>
<td>10</td>
<td>Spring F3 (Tues 8-12, Fri 13-17)</td>
</tr>
<tr>
<td>34552</td>
<td>Photovoltaic Systems</td>
<td>5</td>
<td>Spring F2B (Thurs 8-12)</td>
</tr>
</tbody>
</table>

2. Elective TS-courses (15 ECTS):

Choose among the following or excess courses from the group of GC courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>11108</td>
<td>Building Integrated Photovoltaics</td>
<td>5</td>
<td>Autumn E2B (Thurs 8-12)</td>
</tr>
<tr>
<td>11124</td>
<td>Computational Fluid Dynamics for Buildings</td>
<td>5</td>
<td>Autumn E5B (Wed 13-17)</td>
</tr>
<tr>
<td>11128</td>
<td>Development of solar energy systems</td>
<td>5</td>
<td>Autumn E4A (Tues 13-17)</td>
</tr>
<tr>
<td>31380</td>
<td>Intelligent systems</td>
<td>10</td>
<td>Autumn E1 (Mon 8-12, Thurs 13-17)</td>
</tr>
<tr>
<td>Course</td>
<td>Title</td>
<td>ECTS</td>
<td>Semester</td>
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</tr>
<tr>
<td>31721</td>
<td>Emerging and disruptive technologies of electricity grids</td>
<td>5</td>
<td>January</td>
</tr>
<tr>
<td>31730</td>
<td>Electric power engineering, fundamentals</td>
<td>10</td>
<td>Autumn E4 (Tues 13-17, Fri 8-12)</td>
</tr>
<tr>
<td>31761</td>
<td>Renewables in electricity markets</td>
<td>5</td>
<td>Spring F2A (Mon 13-17)</td>
</tr>
<tr>
<td>31778</td>
<td>Distributed energy technologies</td>
<td>5</td>
<td>Spring F1B (Thurs 13-17)</td>
</tr>
<tr>
<td>31783</td>
<td>Integration of wind power in the power system</td>
<td>5</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
<tr>
<td>33250</td>
<td>Semiconductor Technology</td>
<td>5</td>
<td>Spring F3B (Fri 13-17)</td>
</tr>
<tr>
<td>34540</td>
<td>Light emitting diodes and photovoltaics for energy applications</td>
<td>5</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
<tr>
<td>34551</td>
<td>Thin Film Photovoltaics</td>
<td>5</td>
<td>January</td>
</tr>
<tr>
<td>34553</td>
<td>Applied Photovoltaics</td>
<td>5</td>
<td>June</td>
</tr>
<tr>
<td>41416</td>
<td>Energy systems - analysis, design and optimization</td>
<td>10</td>
<td>Spring F5 (Wed 8-17)</td>
</tr>
<tr>
<td>47311</td>
<td>Analytical imaging of energy materials by electron microscopy</td>
<td>5</td>
<td>Autumn E5A (Wed 8-12)</td>
</tr>
<tr>
<td>47320</td>
<td>Organic solar cells – theory and practice</td>
<td>2.5</td>
<td>Autumn and Spring, January</td>
</tr>
<tr>
<td>47330</td>
<td>Energy storage and conversion</td>
<td>5</td>
<td>Autumn E1A (Mon 8-12)</td>
</tr>
</tbody>
</table>

### 3. Elective courses (30 ECTS):

15 ECTS must be taken either from the list of courses below or from excess courses from the group 2. Elective TS-courses. The remaining 15 ECTS can be chosen freely among DTU advanced level courses.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>ECTS</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>11127</td>
<td>Sustainable heating and cooling of buildings</td>
<td>5</td>
<td>Spring F4A (Tues 13-17)</td>
</tr>
<tr>
<td>31352</td>
<td>Switch-Mode Power Supply 1</td>
<td>10</td>
<td>Autumn E5 (Wed 8-17)</td>
</tr>
<tr>
<td>31354</td>
<td>Circuit technology and EMC</td>
<td>5</td>
<td>Autumn E4A (Tues 13-17)</td>
</tr>
<tr>
<td>34032</td>
<td>Optical Properties of Solids</td>
<td>5</td>
<td>Autumn E1B (Thurs 13-17)</td>
</tr>
<tr>
<td>41421</td>
<td>Advanced power plants</td>
<td>5</td>
<td>Spring F1B (Thurs 13-17)</td>
</tr>
<tr>
<td>42071</td>
<td>Product development in an organizational context</td>
<td>5</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
<tr>
<td>42372</td>
<td>Life Cycle Assessment of Products and Systems</td>
<td>10</td>
<td>Autumn E1 (Mon 8-12, Thurs 13-17)</td>
</tr>
</tbody>
</table>
Commercialization of high tech concepts, entrepreneurship and science in action 5 point Autumn E1B (Thurs 13-17)

Battery materials and chemistries: from fundamental mechanisms to battery cells 5 point Autumn E5B (Wed 13-17)

Advanced computational tools for energy materials 5 point Autumn E5A (Wed 8-12)

Courses within the study line Thermal Energy

Technological specialization courses (35 points)
1. Compulsory TS-courses:

   41416 Energy systems - analysis, design and optimization 10 point Spring F5 (Wed 8-17)

2. Elective TS-courses (25 ECTS):

   11117 Solar Heating Systems 10 point Spring F3 (Tues 8-12, Fri 13-17)
   11128 Development of solar energy systems 5 point Autumn E4A (Tues 13-17)
   12132 LCA Modelling of Waste Management Systems 5 point January
   12136 Bioenergy Technologies 10 point Spring F4 (Tues 13-17, Fri 8-12)
   28244 Combustion and High Temperature Processes 5 point Autumn E4B (Fri 8-12)
   31730 Electric power engineering, fundamentals 10 point Autumn E4 (Tues 13-17, Fri 8-12)
   31761 Renewables in electricity markets 5 point Spring F2A (Mon 13-17)
   41323 Advanced fluid mechanics 10 point Spring F2 (Mon 13-17, Thurs 8-12)
   41343 Fuels and emissions from transportation 5 point June
   41346 IC engines - experimental methods and data processing 5 point Spring F4A (Tues 13-17)
   41420 Refrigeration 10 point Autumn E5 (Wed 8-17)
   41421 Advanced power plants 5 point Spring F1B (Thurs 13-17)
   47301 Hydrogen energy and fuel cells 5 point Spring F1B (Thurs 13-17)

3. Elective courses (25 points):
10 ECTS must be taken either from the list of courses below or from excess courses from the group 2. Elective TS-courses. The remaining 15 points can be used freely for any of the DTU advanced courses.

   01418 Introduction to Partial Differential Equations 5 point Autumn E5A (Wed 8-12)
   02435 Decision-Making Under Uncertainty 5 point Spring F4A (Tues 13-17)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>02686</td>
<td>Scientific Computing for differential equations 1</td>
<td>5 point</td>
<td>Spring F1A (Mon 8-12)</td>
</tr>
<tr>
<td>02687</td>
<td>Scientific Computing for differential equations 2</td>
<td>5 point</td>
<td>Spring F1B (Thurs 13-17)</td>
</tr>
<tr>
<td>10333</td>
<td>Physics of Sustainable Energy</td>
<td>5 point</td>
<td>Autumn E5B (Wed 13-17)</td>
</tr>
<tr>
<td>11117</td>
<td>Solar Heating Systems</td>
<td>10 point</td>
<td>Spring F3 (Tues 8-12, Fri 13-17)</td>
</tr>
<tr>
<td>11127</td>
<td>Sustainable heating and cooling of buildings</td>
<td>5 point</td>
<td>Spring F4A (Tues 13-17)</td>
</tr>
<tr>
<td>11129</td>
<td>Sustainable District Heating</td>
<td>5 point</td>
<td>Spring F1A (Mon 8-12)</td>
</tr>
<tr>
<td>11221</td>
<td>Ventilation and Climatic Systems</td>
<td>10 point</td>
<td>Autumn E1 (Mon 8-12, Thurs 13-17)</td>
</tr>
<tr>
<td>28271</td>
<td>Thermal gasification and sustainability</td>
<td>5 point</td>
<td>Summer</td>
</tr>
<tr>
<td>28451</td>
<td>Optimising Plantwide Control</td>
<td>7.5 point</td>
<td>Spring F2A (Mon 13-17)</td>
</tr>
<tr>
<td>28871</td>
<td>Production of Biofuels</td>
<td>10 point</td>
<td>Spring F2A (Mon 13-17) and Spring F2B (Thurs 8-12)</td>
</tr>
<tr>
<td>28872</td>
<td>Biorefinery</td>
<td>5 point</td>
<td>Autumn E4B (Fri 8-12)</td>
</tr>
<tr>
<td>31778</td>
<td>Distributed energy technologies</td>
<td>5 point</td>
<td>Spring F1B (Thurs 13-17)</td>
</tr>
<tr>
<td>31783</td>
<td>Integration of wind power in the power system</td>
<td>5 point</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
<tr>
<td>41315</td>
<td>Applied CFD</td>
<td>5 point</td>
<td>Summer</td>
</tr>
<tr>
<td>41319</td>
<td>Computational fluid dynamics</td>
<td>10 point</td>
<td>Autumn E3A (Tues 8-12) and Autumn E3B (Fri 13-17)</td>
</tr>
<tr>
<td>41562</td>
<td>Fluid power - oil hydraulics</td>
<td>5 point</td>
<td>Spring F1A (Mon 8-12)</td>
</tr>
<tr>
<td>42372</td>
<td>Life Cycle Assessment of Products and Systems</td>
<td>10 point</td>
<td>Autumn E1 (Mon 8-12, Thurs 13-17)</td>
</tr>
<tr>
<td>42435</td>
<td>Knowledge-based Entrepreneurship</td>
<td>5 point</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
<tr>
<td>46300</td>
<td>Wind Turbine Technology and Aerodynamics</td>
<td>10 point</td>
<td>Autumn E1 (Mon 8-12, Thurs 13-17)</td>
</tr>
<tr>
<td>47309</td>
<td>Materials for hydrogen production and storage</td>
<td>5 point</td>
<td>Summer</td>
</tr>
</tbody>
</table>

**Courses within the study line Wind Energy**

**Technological specialization courses (30 points)**
1. Compulsory TS-courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>46300</td>
<td>Wind Turbine Technology and Aerodynamics</td>
<td>10 point</td>
<td>Autumn E1 (Mon 8-12, Thurs 13-17)</td>
</tr>
</tbody>
</table>

2. Elective TS-courses (20 ECTS):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>31761</td>
<td>Renewables in electricity markets</td>
<td>5 point</td>
<td>Spring F2A (Mon 13-17)</td>
</tr>
<tr>
<td>31783</td>
<td>Integration of wind power in the power system</td>
<td>5 point</td>
<td>Autumn E2A (Mon 13-17)</td>
</tr>
<tr>
<td>31786</td>
<td>Wind Turbine Electrical Design</td>
<td>10 point</td>
<td>Autumn E2B (Thurs 8-12) and Autumn E3B (Fri 13-17)</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>ECTS</td>
<td>Type</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------------</td>
<td>------</td>
<td>--------</td>
</tr>
<tr>
<td>41315</td>
<td>Applied CFD</td>
<td>5</td>
<td>point</td>
</tr>
<tr>
<td>46100</td>
<td>Introduction to Micrometeorology for Wind Energy</td>
<td>5</td>
<td>point</td>
</tr>
<tr>
<td>46200</td>
<td>Planning and Development of Wind Farms</td>
<td>5</td>
<td>point</td>
</tr>
<tr>
<td>46211</td>
<td>Offshore Wind Energy</td>
<td>10</td>
<td>point</td>
</tr>
<tr>
<td>46310</td>
<td>Projects in Wind Turbine Aeroelasticity</td>
<td>10</td>
<td>point</td>
</tr>
<tr>
<td>46320</td>
<td>Loads, Aerodynamics and Control of Wind Turbines</td>
<td>10</td>
<td>point</td>
</tr>
<tr>
<td>46400</td>
<td>Wind Turbine Measurement Technique</td>
<td>10</td>
<td>point</td>
</tr>
<tr>
<td>46800</td>
<td>Research Immersion - DTU Windenergy</td>
<td>5</td>
<td>point</td>
</tr>
<tr>
<td>02685</td>
<td>Scientific Computing for differential equations</td>
<td>10</td>
<td>point</td>
</tr>
<tr>
<td>10332</td>
<td>Physics of Sustainable Energy</td>
<td>5</td>
<td>point</td>
</tr>
<tr>
<td>11129</td>
<td>Sustainable District Heating</td>
<td>5</td>
<td>point</td>
</tr>
<tr>
<td>31742</td>
<td>Power grid analysis</td>
<td>5</td>
<td>point</td>
</tr>
<tr>
<td>31745</td>
<td>Computational electric energy systems</td>
<td>5</td>
<td>point</td>
</tr>
<tr>
<td>31778</td>
<td>Distributed energy technologies</td>
<td>5</td>
<td>point</td>
</tr>
<tr>
<td>31782</td>
<td>Electrical machines</td>
<td>5</td>
<td>point</td>
</tr>
<tr>
<td>41319</td>
<td>Computational fluid dynamics</td>
<td>10</td>
<td>point</td>
</tr>
<tr>
<td>41416</td>
<td>Energy systems - analysis, design and optimization</td>
<td>10</td>
<td>point</td>
</tr>
<tr>
<td>41512</td>
<td>Power transmitting machine elements - design and optimization</td>
<td>5</td>
<td>point</td>
</tr>
<tr>
<td>41514</td>
<td>Dynamics of machinery</td>
<td>5</td>
<td>point</td>
</tr>
<tr>
<td>41525</td>
<td>FEM-Heavy (programming the finite element method)</td>
<td>10</td>
<td>point</td>
</tr>
<tr>
<td>42435</td>
<td>Knowledge-based Entrepreneurship</td>
<td>5</td>
<td>point</td>
</tr>
</tbody>
</table>

**3. Elective courses (30 ECTS):**
10 ECTS must be taken either from the list of courses below or from excess courses from the group 2. Elective TS-courses. The remaining 20 ECTS can be used freely for any of the DTU advanced level courses.

**Curriculum, previous admission years**

**Study line "Hydrogen and fuel cells"**

For students accepted at DTU prior to September 2016 the courses below may be included in group 2 of the Technological Specialization courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Points</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>47308</td>
<td>Experimental Solid Oxide Fuel Cells and Electrolysis</td>
<td>5</td>
<td>June</td>
</tr>
</tbody>
</table>

**Study line "Thermal Energy"**

For students accepted for study prior to September 2018 the following courses also count as technological specialization course:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Points</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>02685</td>
<td>Scientific Computing for differential equations</td>
<td>10</td>
<td>F1A (Mon 8-12) and F1B (Thurs 13-17)</td>
</tr>
</tbody>
</table>

**Study line "Wind Energy"**

For students accepted for study prior to September 2017 the following courses also count as elective courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Points</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>41513</td>
<td>Machine Elements</td>
<td>10</td>
<td>F3 (Tues 8-12, Fri 13-17)</td>
</tr>
</tbody>
</table>

**Master's thesis**

The master's thesis is the final assignment of the programme. The objective of the master's thesis is to give students the opportunity to apply the knowledge they have acquired in an independent way on a larger project that concludes with a written report. The thesis must document skills in applying scientific theories and methodologies to a clearly defined academic topic.

The master's thesis may be prepared either individually or as a group project with a maximum of four students.

The master's thesis must be written in English and it must include an abstract. As an exemption the supervisor of the master's thesis can assess that the thesis may be written in Danish. This decision can only be made due to professional, academic reasons. The Head of studies for the study programme must accept this exemption.

The Head of Studies of the study programme must approve that the master's thesis falls within the programme's technical and scientific field. The Head of Studies automatically receives this
information once the thesis is reported and the student will be directly notified if the topic cannot be approved. The master's thesis may be undertaken in collaboration with a company.

**Project agreement, volume, and project period**

The thesis can only be commenced when the student lacks no more than 15 ECTS credits besides the thesis.

The start time of the thesis is the first working day after the last study activity.

For students with last study activities in connection with semester endings the following start dates apply:

<table>
<thead>
<tr>
<th>Last study activity is a …</th>
<th>Thesis start date is first following working date in …</th>
<th>Dates in 2018/19</th>
</tr>
</thead>
<tbody>
<tr>
<td>… winter exam in December</td>
<td>January</td>
<td>January 2</td>
</tr>
<tr>
<td>… three week course in January</td>
<td>January</td>
<td>January 28</td>
</tr>
<tr>
<td>… summer exam in May-June</td>
<td>August</td>
<td>August 1</td>
</tr>
<tr>
<td>… three week course in June or July</td>
<td>August</td>
<td>August 1</td>
</tr>
<tr>
<td>… three week course in August</td>
<td>August</td>
<td>August 27, 2018</td>
</tr>
<tr>
<td>… reexam in August</td>
<td>August</td>
<td>August 27, 2018</td>
</tr>
<tr>
<td></td>
<td></td>
<td>August 26, 2019</td>
</tr>
</tbody>
</table>

Students and thesis supervisors may always agree on earlier start dates.

Alternate start dates may apply for academic reasons and if approved by the supervisor.

For delayed start, the project registration must always contain a justification for delayed start relative to rules and dates stated above.

*Start time for master thesis if the last study activity is within the semester*

If the last study activity finishes on a day within the semester (e.g. project course), the start time of the thesis must be the first working day after the last study activity.

The supervisor for a master's thesis must be a member of the scientific staff with research obligations holding a permanent position at DTU (not a PhD student) and must be approved by the Head of Department. The supervisor is required to confirm that the student has the requisite academic qualifications for undertaking the master's thesis. The student is required to document his/her qualifications and level in the form of a list of courses he/she has completed. The supervisor must regularly follow the progress of the thesis and ensure that the master's thesis falls within the academic focus area of the MSc Eng programme.
A master's thesis agreement is to be concluded between the student and a supervisor and it must be done well in advance of the starting day of the thesis. The supervisor is responsible for reporting the thesis to the project registration system.

The work must not begin until the final approval of the agreement has been given by the Office for Study Programmes and Student Affairs. The master's thesis agreement is binding and counts as an examination attempt from the time work on the master's thesis has begun. The master's thesis agreement may be cancelled up to the start date of the master's thesis, in which case it will not count as an examination attempt.

The master's thesis must have a scope equivalent to 30, 32½ or 35 ECTS credits. In connection with the formulation of a project agreement, the project period should be specified. A master's thesis must be undertaken as a full-time course of study and the stipulated time is:

- 30 ECTS credits = 5 months
- 32½ ECTS credits = 5½ months
- 35 ECTS credits = 6 months

As a general rule no parallel activities are conducted in this period. Nevertheless in order not to prolong the total time of the study programme the period may be extended with 3 weeks study for every 5 additional ECTS credits from course activity. The project period can also be extended due to documented impairment. The Office for Study Programmes and Student Affairs (AUS-sps@adm.dtu.dk) can assist the supervisor in making this assessment as required. The extension must be reported to the project registration system prior to the start date of the master's thesis.

Specific rules apply for the Corporate MSc Eng Programmes in Civil Engineering plus Computer Science and Engineering. These programmes combine work with studies and are part-time studies.

Therefore their master thesis may be undertaken as a part-time course of study and the stipulated time is

- 30 ECTS credits = 10 months
- 32½ ECTS credits = 11 months
- 35 ECTS credits = 12 months

The content and learning objectives of the thesis
The content of the thesis is to be agreed with the supervisor. The thesis may contain a combination of experimental work, fieldwork, theoretical studies, synthesis, modelling and analysis. All theses must include elements of literature studies and criticism. In addition, the thesis contains the following overarching learning objectives:

A graduate of the MSc Eng programme from DTU:
can identify and reflect on technical scientific issues and understand the interaction between
the various components that make up an issue

- can, on the basis of a clear academic profile, apply elements of current research at international
  level to develop ideas and solve problems

- masters technical scientific methodologies, theories and tools, and has the capacity to take a
  holistic view of and delimit a complex, open issue, see it in a broader academic and societal
  perspective and, on this basis, propose a variety of possible actions

- can, via analysis and modelling, develop relevant models, systems and processes for solving
  technological problems

- can communicate and mediate research-based knowledge both orally and in writing

- is familiar with and can seek out leading international research within his/her specialist area.

- can work independently and reflect on own learning, academic development and specialization

- masters technical problem-solving at a high level through project work, and has the capacity to
  work with and manage all phases of a project – including preparation of timetables, design,
  solution and documentation

During the first month, the student is to submit a project plan outlining the objective of the thesis
and justification for same to the project group at DTU Inside. In the project plan, the student is also
to take into account the overarching learning objectives listed above. When submitting the thesis,
the student is to enclose a separate document presenting the original project plan and a revision of
same, where appropriate. In addition, the document is to include a brief auto-evaluation of the
project process.

**Deadline**
The agreed project period must be observed.

Under special circumstances the Board of Studies may grant extensions of the project period for up
to three weeks. The student must submit the application to the relevant Board of Studies. Find an
overview of the study board chairmen at DTU Inside under ‘Study board chairmen’.

Applications for extensions beyond three weeks should be addressed to the Exemption
Committee for the MSc Programmes in Engineering (CMDU). Application is submitted through
www.dispensation.dtu.dk. The application should be submitted well in advance of the deadline for
the thesis in order for the Exemption Committee to be able to handle the application in time.
Information regarding exemptions can be found at DTU Inside under "Exemption".

The Board of Studies/the Exemption Committee will in its decision place emphasis on whether the
application for extension is based on unforeseen delays.

If the student wish to abandon his/her thesis and start over within a different field of study with a
new deadline, this must be approved by (the new) supervisor as well as the relevant Board of
Studies. However, if the student wish to abandon his/her thesis within a month after the start of the
thesis, approval from the Board of Studies is not necessary. The supervisor must inform the Office
for Study Programmes and Student Affairs and the head of studies, including the approval from the
Board of Studies, whereafter a new project agreement must be made within the new field of study
and with a new ordinary deadline (5, 5½ or 6 months). However, the student will have used one
examination attempt on the abandoned project.
Failure to observe the deadline means that the student will have used one examination attempt. The student and the supervisor must then make a new project agreement for the thesis but with a modified problem formulation within the same field. The new thesis must be submitted within 3 months of approval of the project. This procedure also applies if the student fail his/her exam.

**Assessment**

Learning objectives are an integrated part of the supervision.

In assessment of a master's thesis, the quality of the academic contents will carry the most weight. The student’s writing abilities will also count, though this will be weighted slightly less, while spelling will carry little weight.

The master's thesis is evaluated according to the Danish the 7-point grading scale on the basis of a report and an oral defense. The report and the oral defense will be evaluated as a whole. The master's thesis will be evaluated in conjunction with one or more external examiners. The department, supervisor and examiner will, in consultation with the student, set a date for the oral presentation and defense.

The oral defense must be held no later than 10 work days after submission of the written report. In exceptional circumstances, the head of department can approve a later exam date.

If the thesis is written by more than one student, each student is to be examined individually. However, the assessment of group projects may also include a group exam with the participation of the entire group. In this case, the individual oral exams are carried out after completion of the group exam. Beside the examinee, only group members who have already been examined are allowed to attend this part of the examination. A group member always has the right to deselect a group exam, though. If this is the case the duration of the individual exam must be adjusted.

The oral defense of a project undertaken entirely or in part at a private company may, due to company secrets referred to in the project, be held behind closed doors subject to agreement with the supervisor.

**Master thesis, specific rules**

**Study line "Biofuels"**

The master's thesis will typically comprise a whole semester of research work involving experiments and/or modeling of enzymatic processes or fermentation of substrates to biofuels and other high value products using the sustainable biorefinery concept. The sustainability of the processes will also be evaluated. The master's thesis may also solely consist of an assessment of the resource use and environmental impacts of biofuel production/biorefinery. The project will usually be carried out at DTU Chemical and Biochemical Engineering, but other institutes may also be involved.

**Study line "Electric Energy Systems"**

After individual approval by the supervisor/study line responsible, a MSc thesis within the area of the specialization shall be conducted. The project is typically completed in collaboration with a relevant company. The Master thesis must be 30 points.

**Study line "Energy Savings"**
A Master thesis project must be carried out at DTU Civil Engineering or at DTU Mechanical Engineering, eventually in cooperation with DTU Management Engineering. For other options specific approval must be obtained from the study line responsible.

**Study line "Hydrogen and Fuel Cells"**

The subject of the master thesis must be within the fields of hydrogen technology, fuel cells and renewable energy. The research project will usually be carried out either at the DTU Physics, DTU Chemistry, DTU Nanotech or DTU Energy Conversion, but other institutes may also be involved.

**Study line "Thermal Energy"**

A Master thesis project must be carried out at DTU Mechanical Engineering (section of energy technology) or DTU Energy Conversion. Other departments must be approved by study line responsible.

**Study line "Wind Energy"**

A Master thesis project must be carried out at DTU Wind Energy or DTU Mechanical Engineering (section of energy technology).

**General:**

The thesis can be carried out at DTU Management Engineering provided that the technology of the specific study line is a core element of the thesis.

**Study Activity Requirements and Deadlines**

**Study Activity Requirement**

The study activity requirements mentioned below are applicable from 1 September 2016. Courses passed before this date does not count in the statement of the study activity requirement.

Students must pass at least 30 ECTS credits in the first year of study on their programme and 45 ECTS credits in each of the following years of study. The study activity requirement will be checked regularly.

Specific rules apply for students enrolled at the Corporate MSc Eng Programmes in Civil Engineering plus Computer Science and Engineering. They must pass at least 20 ECTS credits on the first year of study on their programme and 25 ECTS points the following years of study. The study activity requirement will be checked regularly.

The student will be allowed three examination attempts in courses where the accumulated ‘study activity requirement’ applies. This means that it may take up to an extra semester from the time the student fails to comply with the study activity requirement until the student can be withdrawn on account of it, provided that the student by this time has still not passed the required amount of ECTS credits. Thus, a student will not be withdrawn on account of the study activity requirement of 75 ECTS credits until the end of 5th semester after study start, cf. below.

The study activity requirement is accumulated, so the students must fulfill the study activity requirements below:
<table>
<thead>
<tr>
<th>Period</th>
<th>Accumulated study activity requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. year of study</td>
<td>30 ECTS credits</td>
</tr>
<tr>
<td>2. year of study</td>
<td>75 ECTS credits</td>
</tr>
<tr>
<td>3. year of study</td>
<td>120 ECTS credits</td>
</tr>
</tbody>
</table>

The study activity requirements for students enrolled at the Corporate MSc Eng Programmes in Civil Engineering and Computer Science and Engineering is accumulated as illustrated below:

<table>
<thead>
<tr>
<th>Period</th>
<th>Accumulated study activity requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. year of study</td>
<td>20 ECTS credits</td>
</tr>
<tr>
<td>2. year of study</td>
<td>45 ECTS credits</td>
</tr>
<tr>
<td>3. year of study</td>
<td>70 ECTS credits</td>
</tr>
<tr>
<td>4. year of study</td>
<td>95 ECTS credits</td>
</tr>
<tr>
<td>5. year of study</td>
<td>120 ECTS credits</td>
</tr>
</tbody>
</table>

**Students enrolled at February 2016**

Students enrolled at February 2016 must at least pass 15 ECTS credits in the autumn semester 2016 and 45 ECTS credits the following study years.

<table>
<thead>
<tr>
<th>Period</th>
<th>Accumulated study activity requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sep 2016 – 31 Jan 2017</td>
<td>15 ECTS credits</td>
</tr>
<tr>
<td>1 Feb 2017 – 31 Jan 2018</td>
<td>60 ECTS credits</td>
</tr>
<tr>
<td>1 Feb 2018 – 31 Jan 2019</td>
<td>105 ECTS credits etc.</td>
</tr>
</tbody>
</table>

**Students enrolled at September (Year 2015 or earlier)**

Students enrolled at September (2015 or earlier) must at least pass 45 ECTS credits per study year.

<table>
<thead>
<tr>
<th>Period</th>
<th>Accumulated study activity requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sep 2016 – 31 Jan 2017</td>
<td>45 ECTS credits</td>
</tr>
<tr>
<td>1 Feb 2017 – 31 Jan 2018</td>
<td>90 ECTS credits etc.</td>
</tr>
</tbody>
</table>

**Students enrolled at February (Year 2015 or earlier)**

Students enrolled at February (2015 or earlier) must at least pass 22.5 ECTS credits in the autumn semester 2016 and 45 ECTS credits the following study years.

<table>
<thead>
<tr>
<th>Period</th>
<th>Accumulated study activity requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sep 2016 – 31 Jan 2017</td>
<td>22.5 ECTS credits</td>
</tr>
<tr>
<td>1 Feb 2017 – 31 Jan 2018</td>
<td>67.5 ECTS credits etc.</td>
</tr>
</tbody>
</table>

**Study Activity Requirement of 5 ECTS Credit Points**
In order to comply with DTU's study activity requirement students must pass a minimum of 5 ECTS credits each academic year. Regardless of how many examination attempts the student has made, this requirement still applies.

**Maximum Duration of Study**
The MSc Eng programme is a two-year programme. The entire MSc Eng course of study must be completed within three years.

The Corporate MSc Eng Programmes in Civil Engineering plus Computer Science and Engineering are four-year programmes. The entire Corporate MSc Eng course of study must be completed within five years.

**Completion Requirements**
To earn a MSc degree, the student must earn 120 credit points under one of DTU’s MSc Eng programmes and the mandatory courses must have been passed.

### 2.2 Course registration

Course registration and withdrawal of course registration takes place via the Studyplanner.

Newly admitted MSc students and guest students must actively declare that they accept DTU’s honor code to be able to register for courses.

Students must be registered for a course to attend classes—including laboratory exercises—to participate in group work, and to obtain course information via DTU Inside as well as teaching material (notes etc.).

Students are responsible for ensuring that they are registered for the right courses in their study plan.

Students may take the same course twice if they did not fulfill the mandatory prerequisite to qualify for taking the exam in the first place.

Students cannot register for a course they have already passed. A course has been passed if the grade 02 or the assessment ‘Pass’ has been awarded. Reregistrations for passed courses will be rejected.

Students cannot register more courses than the prescribed ECTS credit total of the programme in question. Students can, however, if their passed number of ECTS credits hinder them from reaching the prescribed number of ECTS credits, typically entailing credit transfer, register for a final course of up to 5 ECTS credits, even if they hereby exceed the prescribed ECTS credit total of the study programme in question (see ‘Credit transfer during the study programme’ under ‘Credit transfer’).

A non-mandatory course may be cancelled if less than ten students are registered. Other rules regarding minimum participation are stated in the course description. Mandatory courses and courses from the mandatory course groups cannot be cancelled.

Registrations for courses which do not form part of the student’s study programme will be rejected, unless the course has been pre-approved by the Head of Studies who has notified the Office for Study Programmes and Student Affairs, the Study Administration of this.
BEng and BSc students are automatically registered for courses in the first teaching period (13-week period) in the first semester of their programme. Students must register for all other courses via the Studyplanner.

All approved course registrations are automatically transferred to exam registrations after the supplementary registration period has passed.

Deadlines etc. can be found on DTU Inside under ‘Registration deadlines for courses and examinations’.

2.4 Academic prerequisites for course participation

Prerequisites and rules for course participation are specified in the course description.

Lecturers are responsible for ensuring that exercises and other laboratory and workshop activities take place under safe conditions. They must therefore provide thorough instructions. Students who fail to understand or respect the lecturer’s safety instructions may be expelled from the activity.

Mandatory prerequisites
Students are required to pass courses specified as a mandatory prerequisite before participating in the course. Students may only register for the course and, if relevant, take part in a drawing of lots if they have passed or are registered for the exam in the mandatory course.

Recommended academic prerequisites
Recommended academic prerequisite courses form the basis for the teaching, and students are expected to have knowledge of the topics covered by the courses. Students who do not have the necessary prerequisites are not entitled to extra academic counselling and may, if necessary, be expelled from the class.

2.5 Participation in limited admission courses

A number of courses at DTU have limited admissions due to for example laboratory exercises. If there is limited admission to a course, it is specified in the course description.

2.5.1. Guidelines in relation to overbooked courses
No later than one month before the start of the teaching period, a study announcement will be sent out with information about the procedure for the drawing of lots in the event of overbooked courses.

All students who have registered for a course for which participation will be determined by drawing lots will receive an email after the draw with status information. There are three status types:
– Place on the course guaranteed
– On the waiting list
– Lost draw.

Students, who have been granted a place in the course, but who do not attend classes when the course starts and fail to notify the lecturer of subsequent attendance will not be permitted to keep their place in an overbooked course after the dates stated below:

13-week period: after the end of class on the first day of teaching in the course
3-week period: four hours after course commencement

The place will be given to the next student present with the lowest number on the waiting list.
2.5.2 Priority in case of drawing of lots
It may be stated in the course description that students enrolled on certain study programmes have priority in a drawing of lots. Students who have registered for a course within the deadline will be assigned a place or participate in the drawing of lots according to this priority. If nothing is stated in the course description, all full-time students who have registered within the deadline will participate in the draw equally.

- Full-time students who have registered within the deadline and students on the flexible master’s programme (part-time programme) have priority over guest students and students on the other part-time programmes in any drawing of lots.

- Students for whom the course is mandatory or forms part of one of the mandatory groups have priority over students for whom the course is not mandatory. If a student for whom a course forms a mandatory part of the programme loses a draw, the student in question will be guaranteed a place next time the course is offered.

- Guest students studying at DTU under an exchange agreement between DTU and an international partner university, and for whom the course constitutes a mandatory programme element, take precedence over full-time students for whom the course is not mandatory as well as over other guest students and part-time students.

- Guest students and students enrolled on part-time programmes for whom a course constitutes a mandatory programme element take precedence over guest students and students on part-time programmes for whom the course is not mandatory.

- Guest students and students on part-time programmes who have registered within the registration deadline will be assigned a place in overbooked courses and have priority over full-time students who register after the deadline.

2.6 Mandatory participation in class and mandatory assignments

2.6.1. Mandatory participation in class
Attending classes is generally not mandatory. However, many courses (practical courses, laboratory courses, etc.) require active participation to pass the course. In connection with projects, giving presentations and acting as a critic in relation to presentations given by other students may be mandatory. If participation is mandatory, this must be specified in the course description.

2.6.2. Mandatory assignments etc.
Submission of assignments and reports may be optional for students, a prerequisite in order to qualify for taking the exam, or the assignments may form part of the exam. Students can only expect to have take-home assignments assessed that have been submitted on time.

If mandatory assignments do not constitute the basis for assessment but are a prerequisite for taking the exam, this must be stated in the course description. The mandatory assignments must meet the
learning objectives for the course in terms of form and content, and it is expected that the course coordinator provides the students with feedback on the assignments.

The individual course coordinators decide on the criteria for approval of mandatory assignments and inform the students.

2.6.3. Illness or other legitimate reasons for absence from mandatory activities
Students who, due to illness or for other legitimate reasons, are prevented from participating in mandatory teaching modules or completing laboratory or workshop activities must notify the lecturer responsible as soon as possible. The student can agree with the lecturer to retake the mandatory activity or have it replaced by a similar activity. If this is not possible, the student is entitled to take the activity again the next time the course is offered. The student must be able to document the reason for being absent.

If the student is unable to participate in the exam in the course due to legitimate absence, the student must submit documentation for the reason for the absence, if the exam is not to count as an exam attempt (see ‘Illness in connection with exams’ under ‘Exams’).

2.7 Deadlines for publication of teaching material and syllabus
Information about material forming part of the exam syllabus must be available on DTU Inside no later than three weeks before the end of the teaching period together with a description of the syllabus or other reading guidelines.

2.8 Project courses
The content of a project course is agreed between the student(s) and a DTU supervisor. Registration for project courses takes place at the relevant department via the project reporting system before the project course starts.

The ECTS credit for a project course ranges from 5 to 30 ECTS credits with intervals of 2.5 credits. 5 ECTS credits correspond to around three weeks of full-time study. In exceptional cases, it is possible to take a project course corresponding to 2.5 ECTS credits, for example if the course constitutes the final element of the programme. In such case, the lecturer must contact the Office for Study Programmes and Student Affairs with a view to registering the course.

The project period for a project course cannot extend six months. The agreement made regarding a project course is binding on both parties, but can be changed according to agreement between the parties. The project course must be documented in a report or similar.

If a student fails a project course a re-exam is possible. The supervisor makes this decision based on academic reasons. The department board of studies make a decision in the event of a disagreement between the student and the supervisor. The student can always plead for the right of three examination attempts in the course.

2.8.1 Projects in cooperation with a company (project-based exams)
A project course can be carried out entirely or partially with a company in Denmark or abroad (a project-based exam). The academic content, learning objectives as well as form of assessment and grading must be agreed with a DTU supervisor. The supervisor is responsible for ensuring that the project has a sufficient academic/theoretical level. The ECTS credit total is based only on the
expected project workload, which means that the duration of the internship with the company is not credit awarding.

The students are responsible for finding a company, but many departments have contact with a number of companies. It is recommended that students carry out projects in cooperation with companies in the final part of the study programme.

Students can also search the DTU Internship and Project Bank where company projects are posted, among other things. DTU’s Internship and Project Bank can be found at Projektbank.dtu.dk.

When completing an unpaid project-based exam students may under certain conditions receive a token of appreciation from the company. The token of appreciation may have a worth of up to DKK 3,000 per month and may not be given as a pre-agreed upon income, like a salary.

**Project proposals**

Students are recommended to draw up a project proposal to be signed jointly by the student, the supervisor, and the company, since all three parties must agree on the project.

The project proposal should contain the most important details related to the project: project title, specific tasks, expected working hours/time of arrival, duration of the internship with the company, etc. If the company makes requirements in relation to confidentiality and rights to use the project, two separate agreements can be made with the student and DTU, respectively.

The project supervisor can refer the student to the person responsible for contracts at the relevant department. The project supervisor can find an overview of persons responsible for contracts on DTU Inside under ‘Forskningssamarbejde, jura og kontraktforhold’ (in Danish only).

**Insurance**

During an internship with a company in connection with a project, the insurance taken out by Polyteknisk Forening (PF student association) does not provide cover (see ‘Insurance for students’).

**2.8.2 Portfolio credit courses**

By registering for a portfolio credit course, BSc and MSc students have the opportunity to obtain up to 10 ECTS credits in the elective courses group for competences acquired through work experience, starting their own business, online courses, etc. after admission to their current study programme at DTU. Students generally register for the portfolio credit course after acquiring the relevant competences.

In the portfolio credit course, the students account for the academic/professional competences acquired in a report. The competences must be at the same or at a higher level than the level the students would otherwise achieve on the study programme. A portfolio credit course can be equivalent to 5, 7.5, or 10 ECTS credits. Students must register for a portfolio credit course at a department, and each student must be assigned a DTU supervisor, who determines the evaluation and assessment form.

**Exam forms**

A course exam may be written, practical, oral, or a combination thereof, for example a series of part exams during the course.
In connection with the approval of course descriptions, the Department Board of Studies decides on the form of assessment, including type of part exams, to be used on the course.

Different rules governing the main forms of assessment are described below. Other forms of assessment can be approved by the relevant Department Board of Studies.

Students must contact ‘Student Services’ (studiereservice@adm.dtu.dk) to apply for a change in the exam form (e.g. from written to oral exam) on the basis of special circumstances, for example a documented permanent functional impairment. ‘Student Services’ will then contact the Department Board of Studies/course coordinator for an assessment of whether this is academically sound and practically possible. The Special Educational Support (SPS) employees (aus-sps@adm.dtu.dk) in the Office for Study Programmes and Student Affairs can provide assistance for this assessment as required. A precondition for allowing special exam arrangements is that the academic level of the exam is not lowered.

A list of study board chairmen at the individual departments can be found on DTU Inside under ‘Study board chairmen’.

Practical exams as part of the teaching or as a final test
Courses comprising exercises (laboratory courses, workshop courses etc.) may be subject to continuous assessment or include a practical exam at the end of the course. In connection with continuous assessment, the students must be informed of the criteria for passing the course at the beginning of the course. Each student’s contribution must be clearly stated so they can be assessed individually.

Oral exams
As a general rule, all oral exams are open to the public, but can be held behind closed doors under special circumstances—justified, for instance, on grounds of student needs. Projects which, entirely or partially, are carried out with private companies, may, taking into account any information about trade secrets, know-how etc. in the report, be treated as confidential, be held behind closed doors too.

Oral exams may extend over several days. Any dates in addition to the specified exam dates must be agreed with the students. Students who are unable to attend an examination on these additional days, are entitled to participate in the exam on the exam date in accordance with the timetable or another day subject to agreement with the lecturer.

If an individual oral exam is held as a follow-up to a group project and as a follow-up to an oral group exam, if relevant, the other students in the group may not be present in the exam room before their own individual oral exam.

Oral exams must be taken before the end of the exam period, unless otherwise agreed between the course coordinator and the students.

Oral group exams
An oral exam can take place as a group exam. Group exams are typically held in connection with written assignments prepared by two or more students (group project).

At oral group exams, the students are examined individually in such a way as to ensure that an individual assessment is made of the students’ performance. When organizing an oral group exam, the course coordinator must ensure that the time allocated for the exam is adapted to the number of
students participating in the exam. All members of the project group are present during the entire exam.

It is important that each assessor notes the level and quality of participation of the individual students. The assessors must also ensure that all students participate in the exam to allow individual assessments to be made.

Students are entitled be awarded the grade in private.

The possibility of choosing an individual exam instead of a group exam is only available to students with documented special educational needs. Students must contact ‘Student Services’ (studieservice@adm.dtu.dk) to apply for this. ‘Student Services’ will then contact the Department Board of Studies/course coordinator for a decision. However, special rules apply to final projects. Read more at DTU Inside under ‘Final projects’ under ‘Structure and rules’ or in the study programme curriculum.

Submission of written assignments during the course
Submission of assignments, reports, posters, etc. may be

- an offer to students
- a prerequisite for being able to take the exam (mandatory assignments—see DTU Inside under ‘Mandatory class participation and mandatory assignments’ under ‘Teaching’, or
- be included as part of the assessment basis (part exam).

Written assignments can be prepared individually or as group projects.

Students can only expect to have take-home assignments corrected/assessed that have been submitted on time.

Group projects
DTU recommends a maximum of six students for group projects in connection with courses. The individual course coordinator may decide on a lower or higher maximum number than six if this is in line with the learning objectives for the course.

Special rules apply to group size for BEng projects, BSc projects and MSc theses (see DTU Inside under ‘Final projects’ under ‘Structure and rules’).

Group projects can be written in two different ways. It is of great importance to the exam form whether the project is individualized; see below.

For a group project, an independent grade or other assessment can only be awarded if the individual student’s contribution to the project can be ascertained (individualization). It must be clearly specified for which sections each student has the (main) responsibility and several students may well have the (main) responsibility for the same section. A group project is not deemed to be individualized if the students merely state that they have contributed equally to all sections of the report or the like.

Before the students commence a group project, the course coordinator must inform the students whether they are required to individualize the project. If a group project does not comply with the
course coordinator’s requirements for individualization or other formal requirements, the paper may be rejected and no assessment given.

a. Group projects without individualization
A group project for which the students’ individual contributions are not specified must always be followed by an oral exam, as it is not possible to make an individual assessment on the basis of the group project alone. The assessment is then based on an overall assessment of the project and the subsequent oral exam. The oral exam can be either an individual exam (i.e. one student at a time) or an oral group exam; see the above.

b. Group projects with individualization
Several students can contribute individual sections to a joint report. Provided that the students’ individual contributions are clearly distinguishable in the joint report, a subsequent oral exam is not required. It is accepted that general descriptive sections such as the introduction and the conclusion are prepared jointly. However, the most important sections in a group project must be individualized.

Written exams (written on-site exams)
Written exams are always individual. The duration of the exam must be stated in the course description.
If less than ten students register for a written exam, the lecturer is entitled to change the assessment form to an oral exam up until one week after the exam registration deadline. This must be done with due regard for the fact that the students were expecting a written exam. The department is responsible for notifying the students in the event of a change in the assessment form. If the exam form is changed into an oral exam, the lecturer can request that registered students contact the department regarding the exam planning. If the lecturer and all registered students agree, another approved assessment form can be applied.

Exam papers must be prepared in the language of instruction. In connection with courses taught in English based on English teaching material, exam assignments must be prepared in English only. Exam papers must be prepared in the language of instruction. The assessors may allow exam papers to be submitted in other languages. Special rules apply to MSc theses.

Students should arrive at a written exam 15 minutes before the exam begins to prepare themselves for the exam start. Students who show up after the exam has started will not be allowed to participate in the exam. They will then receive an assessment of ‘Did not take exam’ (‘Ej Mødt’).

Mobile phones, music players, ear protectors or the like must not be brought to the exam. Mobile phones will be collected prior to the exam and stored by the invigilators during the exam. Mobile phones are stored at the owner’s risk.

Rescheduled exam for a cancelled written exam (on-site exam)
As part of DTU’s exam contingency plan, a permanent scheme has been established with extra days in which to hold any rescheduled exams. A rescheduled exam is only to be used as an absolute emergency procedure if, in exceptional cases, a written exam (on-site exam) for a course cannot be held as planned after all options for holding the exam as planned have been exhausted.

A rescheduled exam is an offer to the students which they forfeit if they do not use it, and they can then, at the earliest, participate in a new exam the next time a (re-)exam is offered on the course. If the students do not make use of the offered rescheduled exam, they will not be registered for an exam attempt.
At DTU Inside under ‘Exam dates’ under ‘Structure and rules’, there is an overview of the scheduling of rescheduled exams for two and a half years into the future.

**Rules and regulations chapter 4**

**Rules and regulations chapter 3**

**Rules and regulations chapter 2**

### 4.3 Studying abroad

A thorough description of the possibilities for studying abroad and the application deadlines can be found on DTU Inside under ‘Study Abroad’ or on DTU’s website.

To be eligible for an exchange place, students must meet the following criteria:

- Students enrolled on a BSc or BEng programme must have completed at least two years of study (120 ECTS credits) prior to commencement of the exchange stay, unless the student is attending a summer school abroad.
- Students must be enrolled on an ordinary full-time DTU programme at the time of application and during the entire exchange stay.

Students are expected to pass and transfer at least 20 ECTS credits per semester (however, not students attending summer school abroad) and comply with other study activity requirements made by DTU, the host university, and other relevant bodies. Students, who do not comply with this requirement, may be requested to repay any grants received from DTU.

### Transferring to an MSc programme

Students lacking 55 ECTS credits or less of their BEng/BSc programme at DTU can apply to take MSc courses worth a total of up to 30 ECTS credits, provided that they wish to apply for admission to an MSc programme at DTU and meet the admission requirements and academic prerequisites for admission into the MSc programme in question. Exemption will not be granted for additional ECTS credits. The using of this rule may not lead to a prolongation of the total time of study of the BEng/BSc programme.

If one or more of the desired MSc courses is or are project courses, the students must specify the department with which the special course is being taken in their application for a transfer of courses, and how many ECTS credits the individual special course constitutes.

Students must take courses, which are part of their BEng or BSc programme concurrently with the courses forming part of the future MSc programme.

When processing the application, DTU places emphasis on whether the student is deemed to have the academic prerequisites to complete courses on the MSc programme concurrently with completing the BSc/BEng programme.
The student must still apply for admission to the MSc programme before completing the BSc/BEng programme.

An electronic application form can be found at DTU Inside under ‘Transferring to a MSc programme’. Students can only apply for one semester at a time. The application must be filled out and sent from the student email to kandidatopt@adm.dtu.dk no later than one week after the beginning of the semester.

Students can apply for an exemption from the application deadline due to exceptional circumstances which have made it impossible to meet the above the deadline. An application for an exemption is submitted together with the application form transfer of courses to studieservice@adm.dtu.dk. Decision regarding the application will be sent to the student email.

In allowing the student to take MSc courses concurrently with completing the BSc/BEng programme, DTU makes no decision on whether the student has exceeded any study activity requirements or deadlines, is in need of extra examination attempts or exemption hereof etc.

Students who have taken MSc courses concurrently with completing their BSc/BEng programme must still comply with the study activity requirement following admission to the MSc programme. The number of transferred ECTS credits will not be deducted from the study activity requirement.

Applicable from the academic year 2018/2019 the maximum duration of study is reduced with one semester if students have passed 30 ECTS credits of MSc courses under the transitional procedure.

**MSc courses passed under the transitional procedure**

MSc courses passed under the transitional procedure will automatically be transferred from the BEng/BSc programme when the student is admitted to the MSc programme.

If the student chooses a different MSc study programme to that originally planned, only passed MSc courses, which are mandatory for the new study programme will be transferred. However, the student can always ask to have passed electives transferred. The same then applies as when changing study programme.

**MSc courses not passed under the transitional procedure**

For an MSc course, which the student does not pass under the transitional procedure, the rule on binding course registration applies. If the student wishes to be exempted from the course on the MSc study programme, the student must apply for an exemption to be released from the course.

If the student applies to do a different MSc study programme to that originally planned, his or her binding registration for a failed course will be cancelled unless the course is mandatory on the new study programme.

**SU on completion of BEng/BSc programme**

The BEng/BSc programme has been completed when the grade in the last course/project on the study programme has been registered. This also applies even if the final grade is registered in the middle of the semester and even if the courses in the semester that the transfer of courses concerns are not yet concluded.

When the BEng/BSc programme is completed, the student will no longer be entitled to receive SU or a completion loan. This means that when the student completes his BEng/BSc programme, he or
she is no longer enrolled on a study programme and is therefore not entitled to SU even though the student in question is still following courses in the semester that the transfer of courses concerns.

**Exemption**

Students who fail to comply with DTU’s rules governing their study programme may only continue their studies if granted an exemption. DTU’s exemption committee may grant an exemption from rules contained in curricula, course descriptions, and DTU’s rules and regulations, provided that the exemption does not conflict with any acts or ministerial orders in the field of education.

The decision of the exemption committee on an application for exemption is discretionary. The discretionary decision must be made after a detailed individual assessment of the student’s reasons for applying for an exemption.

Applications for exemption must be justified and accompanied by the necessary documentation. Applications for exemption regarding illness must always be accompanied by medical documentation. An application must also always be accompanied by a realistic study plan (prepared in the study planner) as well as a transcript of records including all exam attempts.

Applications for exemptions can be justified by the following:

1. Special circumstances, such as personal illness, serious illness/death of a close relative (parent, grandparent, child as well as spouse/partner), civic duties to serve as a lay judge or juror, compulsory military service, or other unusual, external circumstances in the life of the individual student and for which the student is not usually responsible. 
A medical certificate for both physical and mental illness should include the doctor’s assessment of how the illness affects the ability of the student to study, including a prognosis of the duration of the disease.

2. Functional impairment, where any special educational support (SPS) does not compensate sufficiently for the impairment. Documentation must be provided for the impairment, including any compensation the student receives in the form of special educational support.

3. The student is an elite athlete. The applicant must attach a statement from the relevant sports association which documents that the student is an elite athlete.

4. The student is an entrepreneur. Students must as a minimum document either that they have their own business which has revenue and income-generating activities (company registration no. (SE no.), annual accounts, and a description of the company should be supplied), or that they are part of an entrepreneurial environment, for example an incubator or entrepreneurial environment at DTU or regional growth environments.

5. The student is chairman of a voluntary organization under the Danish Youth Council (DUF), a member of the board of Polyteknisk Forening (PF student association), or similar organizations, and is able to document that the activities are so time-consuming that being a full-time student is not possible.

*Exemption in connection with maternity/paternity leave*
Upon submission of an application, the study activity requirement will be reduced by 45 ECTS credits for the birth giving parent. At the same time, the maximum period of study is extended by one year. Any first-year exams will be postponed correspondingly.

Upon submission of an application, the study activity requirement will be reduced by 22.5 ECTS credits for the non birth giving parent. At the same time, the maximum period of study is extended by six months. Any first-year exams will be postponed correspondingly.

Applications to reduce the study activity requirement on the basis of maternity/paternity leave must be made by sending an email from your student email address accompanied by the required documentation to studieservice@adm.dtu.dk. The application must be send by the student no later than a year after the child birth.

Application to be released from a course
An application to be released from a course must be accompanied by a statement from the head of studies if the course is a compulsory course in the student’s curriculum. The justification and documentation requirements are stricter if it is not the first time that the student is applying to be released from a course.

Circumstances which do not generally entitle students to exemptions
As a general rule, the exemption committees do not grant exemptions based on the following circumstances:

- Regular or voluntary work
- Participation in committee and board work, including department boards of studies and the advisory committees for the MSc programmes (CUU) and BEng programmes (DUU), respectively
- Lack of knowledge of the rules governing the study programme
- Personal circumstances, such as housing or financial problems, etc.

The application
Applications for exemptions must be submitted electronically via the exemption application system www.dispensation.dtu.dk. You can read more about submitting exemption applications in the Student Counselling Office’s guide ‘I want to apply for exemption’. Meeting dates for the exemption committees and application deadlines can be found at DTU Inside under ‘Deadlines and meeting dates’ under ‘Exemption’.

Students who are not granted an exemption can appeal against the decision to the Dean of Undergraduate Studies and Student Affairs, who has been authorized by DTU’s President to deal with appeals regarding exemption decisions. The deadline for submitting an appeal is two weeks from the day on which the committee’s decision is announced to the student. Appeals must be made in writing and reasoned, and must be submitted via the exemption application system www.dispensation.dtu.dk.
Leave of absence

Students are able to apply for justified leave of absence from their study programme for up to one year. Leave of absence on special grounds may, for example, be due to, adoption, military service, or illness.

Students will not receive monthly grants (SU) during their leave of absence, and any deadlines relating to the study programme, e.g. the first-year exam and maximum duration of study, will be extended by the period of leave (calculated in entire semesters).

Personal illness:
Includes any illness, including mental illness, which leaves the student incapable of active study. A medical certificate is required as documentation, which must state that the student is unable to study as a result of the illness, and the medical certificate must also state how long the student will be or is expected to be ill.

Illness of a close relative:
Leave of absence can be granted to care for a close relative who is seriously ill or dying. Close relatives are parents, grandparents, children, and spouse/cohabiting partner. However, other persons may also be regarded as being close. It must be documented that the person in question is close, and that he or she is seriously ill.

Other special circumstances:
Leave of absence can also be granted due to other special circumstances that may justify this. Special circumstances are factors which make or will make it impossible for the student to engage in active study. In other words, factors which are beyond the control of the student and which must be documented.
Applications for leave of absence as well as documentation must be submitted to the Office for Study Programmes and Student Affairs at studieservice@adm.dtu.dk from the student’s student email address no later than three weeks into the required period of leave. The application form can be found at DTU Inside under ‘Leave of Absence’.

Students who have failed to comply with DTU’s rules regarding study programmes cannot apply for leave of absence until they have been granted an exemption to continue their studies.

All study activity must stop during the period of leave. This includes participation in courses and the submission of projects. However, students may continue to register for and sit exams in the exam period during their leave of absence.

Students may only exercise their voting rights and retain their eligibility during a leave of absence period exceeding six months if the period of leave expires at the beginning of the term of office at the latest.

During the period of leave, students must stay up to date on study announcements posted by DTU.

Students who want to return to their studies before the end of their leave of absence must send an email to studieservice@adm.dtu.dk to that effect.
If a student wishes to extend his/her leave of absence in excess of one year, the student must apply for an exemption for extended leave at www.dispensation.dtu.dk. More information can be found at DTU Inside under ‘Exemption’.

Withdrawal from study programmes

Students who wish to withdraw from their study programme at DTU can use the withdrawal form at DTU Inside under ‘Withdrawal from study programmes’. The filled out form must be sent from the DTU student mail to studieservice@adm.dtu.dk.

Please note a withdrawal cannot be cancelled.

Students cannot be enrolled on more that one full-time study programme at the time.

There are several things a student has to be aware of when considering withdrawing from the study programme. Therefore it is always recommended to contact the Study Guidance office (Danish students) or International Study Guidance Office (non-Danish students) for guidance on the issue.

Readmission into BSc Eng and BENG programmes

Readmission to BSc and BEng programmes

If previously enrolled students want to study at DTU again, they can apply for readmission.

If applicants have themselves withdrawn from their study programme, they may be readmitted to the same study programme within the same type of degree (BSc, BEng or MSc) at the earliest five months after their enrolment was terminated.

Applicants who have been disenrolled from their study programme by DTU for study-related reasons or who are in violation of DTU’s rules at the time of application for readmission will need to apply for an exemption. Such an application is only to be submitted once the applicant has been notified by DTU that he or she must apply for an exemption. An exemption must be applied for regardless of whether the student is applying for a place on a different study programme than the one in which the student was previously enrolled. If the application for an exemption is accepted, it will be assessed whether the applicant can be readmitted. If the application for an exemption cannot be accepted, the student’s application for readmission will be rejected.

If applicants apply for readmission and have already completed a higher education programme, they will be covered by the Danish Act on Barring of Second Degrees (Lov om begrænsning af dobbeltuddannelse).

If the last passed course on the student’s DTU study programme dates back more than five years prior to readmission, courses on the study programme cannot—as a general rule—be transferred to the new study programme to which the student has been admitted. However, an exemption may be granted from this rule in special cases following an application from the student. The relevant head of studies will assess whether an exemption may be granted from the five-year limitation period.

Readmission to BSc and BEng programmes
**Application and application deadlines**

*Readmission with study start on 1 September*

Applicants who apply for readmission must comply with the same deadlines as other applicants for DTU’s BSc and BEng programmes. Application deadlines are found at [DTU.dk under ‘Admission to BSc and BEng programmes’](#).

However, it should be noted that applicants who have already passed 60 ECTS credits or more on higher education programmes must apply for readmission no later than on 1 May.

Applications for readmission are submitted via [www.optagelse.dk](#).

*Readmission with study start on 1 February*

Applicants who apply for readmission must comply with the same deadlines as other applicants for DTU’s BSc and BEng programmes. Application deadlines are found at [DTU.dk under ‘Admission to BSc and BEng programmes’](#).

However, it should be noted that applicants who have already passed 60 ECTS credits or more on higher education programmes must apply for readmission no later than on 1 November.

Readmission is applied for via an application form, which is available during the application period at DTU’s website under ‘Special information about winter admissions’.

**Processing of the application**

Applicant may be readmitted either *outside the ordinary admission* or *through the ordinary admission*.

**Applicants will be readmitted outside the ordinary admission (quotas 1 and 2) if all the following conditions are met:**

- The applicants meet the applicable admission requirements for the study programme.
- The applicants are granted an exemption following any application for this.
- The applicants have passed courses corresponding to the first academic year of the study programme for which they are applying for readmission.
  - On a BEng programme, the first year of study has been passed if minimum the first and second semesters of the study programme in question have been passed.
  - On a BSc programme, the first year of study has been passed if minimum 60 ECTS credits from the three mandatory blocks of courses (basic natural science courses, technological specialization courses, and projects and professional skills courses) have been passed.
- There are vacant places at the level of study on the study programme for which the applicants are applying. If the number of students applying for readmission exceeds the number of vacant study places, the places will be distributed in a decreasing order of grade point average from the qualifying upper secondary school exam.

**Applicants will be readmitted through the ordinary admission (quotas 1 and 2) if:**

- The applicants meet the applicable admission requirements for the study programme.
- The applicants are granted an exemption following any application for this.
The applicants have passed courses corresponding to the first academic year of the study programme for which they are applying for readmission.

On a BEng programme, the first year of study has been passed if minimum the first and second semesters of the study programme in question have been passed.

On a BSc programme, the first year of study has been passed if minimum 60 ECTS credits from the three mandatory blocks of courses (basic natural science courses, technological specialization courses, and projects and professional skills courses) have been passed.

The applicants’ grade point average is high enough for admission through quota 1, or if the applicants are prioritized high enough to be admitted through quota 2.

**Deadlines and exam attempts for students who are readmitted to BSc and BEng programmes**

**Deadlines**

The study activity requirement for students readmitted through the ordinary admission is 30 ECTS credits in the first academic year and subsequently 45 ECTS credits per academic year. The academic year is calculated from the date of readmission.

The study activity requirement for students readmitted outside the ordinary admission is 45 ECTS credits per academic year. The academic year is calculated from the date of readmission.

The maximum period of study for readmitted students is the prescribed period of study + one year from the readmission date; however, reduced by one semester for every 30 ECTS credits which the student has already passed.

**Exam attempts for students admitted to BSc and BEng programmes**

**Readmission to the same study programme**

The students are granted a new exam attempt on courses for which all exam attempts have been used if the course forms part of the study programme.

**Readmission to new study programme**

For students who are readmitted to DTU on a new study programme, the number of used exam attempts on failed courses they have previously attended at DTU is zeroed. The students are allocated three new exam attempts on the courses in question if these courses can be included in the study programme to which the students are now readmitted.

**Re-exams**

Students may participate in an offered re-exam without having participated in the previous ordinary exam on a course if they meet the requirements for participation in the ordinary exam. See below under ‘Courses with mandatory assignments as a prerequisite for exam participation’.

On courses with part exams, students must be aware that a re-exam is solely a repetition of the final part exam on the course. See below under ‘Courses with part exams’.

Students who have not passed a course at the first exam attempt must themselves register for the subsequent exam attempt on the course.

The time of the re-exam will depend on when the course in question is offered:
- For courses offered in the 13-week autumn period with ordinary exams in December, the re-exam period is in May
- For courses offered in the 13-week spring period with ordinary exams in May, the re-exam period is in August
- For courses offered in the 3-week period in January with ordinary exams in January, the re-exam period is in May
- For courses offered in the 3-week periods June/July with ordinary exams in June/July, the re-exam period is in August
- For courses offered in the 3-week period in August with ordinary exams in August, the re-exam period is in December.

Courses offered in several of the above teaching periods have corresponding several re-exam periods.

If, in exceptional cases, a course is not suitable to be offered for a re-exam based on a security or academic assessment, students who have not passed the course must attend the course again. The relevant Department Board of Studies must approve that the course is not suitable for being offered for a re-exam, and it must also be stated in the course description under ‘Evaluation form’.

An overview of exam dates can be found at DTU Inside (see ‘Exam dates’ under ‘Exams’).

Registration for and withdrawal from re-exams must be done within the applicable deadlines (see ‘Registration and withdrawal deadlines’ under ‘Exams’).

The course coordinator may decide that the evaluation form at the re-exam may differ from the evaluation form at the ordinary exam. The course coordinator must notify the students about the evaluation form at the re-exam in August no later than one week after the exam registration deadline. The course coordinator must notify the students about the evaluation form at the re-exam in May and December no later than one week after the exam registration deadline.

For rules on re-exams on special courses, see ‘Special courses’ under ‘Teaching’.

3.10.1. Courses with mandatory assignments as a prerequisite for exam participation
A student whose mandatory assignments have not been approved—and who therefore cannot participate in the ordinary exam—cannot participate in the re-exam on the course unless, before then, the course coordinator has given the student a new opportunity to meet the prerequisite. The student is responsible for contacting the course coordinator to clarify this matter. Students who are unable to meet the prerequisites will have to attend the course again.

Students who meet the prerequisite for exam participation on a course—but who do not pass the exam—can take the re-exam on the course in the next re-exam period without having to submit the mandatory assignments, etc. again.

If students choose to postpone their re-exam—or if they do not pass their re-exam in accordance with the above—they are not entitled to be allowed to take (another) re-exam based on previously approved mandatory assignments, etc. Based on an academic assessment, the course coordinator may, however, approve that the student can register for a re-exam without having to submit the assignments again.

Read more at DTU Inside under ‘Mandatory class participation and mandatory assignments’.

Courses with part exams
In a course with part exams, any re-exam is only a repetition of the final part exam on the course. Part exams scheduled in the teaching period will thus not be offered for re-exam or be assessed in the period between the ordinary exam and re-exam on the course. This rule may be deviated from by the course coordinator.

As a general rule, part exams already passed (i.e. approved or with the minimum grade of 00) will be included in the next re-exam period. In connection with a re-exam, students are thus not entitled to retake a non-approved/failed (grade of 00) part exam. However, under special circumstances, students may have to retake a passed part exam in connection with a re-exam. Such a decision is made by the course coordinator based on an academic assessment. In the case of disagreement between a student and a course coordinator regarding whether or not a part exam must be retaken in connection with a re-exam, the Department Board of Studies will make the decision.

The course coordinator may approve that passed/approved part exams are included in subsequent re-exams.

Read more about part exams at DTU Inside under ‘Pass requirements and part exams’ under ‘Exams’

Special circumstances regarding final exams
If a student has been ill at the (re)exam during exam period, in which the student should have completed his/her education, the student will be able to sit the re-exam in the same exam period or immediately after to the re-exam period. This also applies to a student who does not pass (non-attendance, grade -3 or 00, or not passed) a single (re)exam in the exam period in which the student should have completed his / her education. Students who have been absent from the exam (non-attendance) are not entitled to a quick re-exam.

Students wishing to take a quick re-exam according to the above rules, should contact the Office for Study Programmes and Student Affairs in person no later than 14 days after publication of the grade. The student must contact the relevant institution immediately after approval from the Office for Study Programmes and Student Affairs.

3.10 Exam complaints

Exam complaints must be submitted within two weeks of the announcement of the grade on DTU Inside. For oral examinations, the deadline is two weeks after the examination is held.

If possible, within the time limit students are encouraged to discuss their exam paper/performance with the course coordinator/examiner before submitting an exam complaint. The two-week submission deadline, however, still applies.

Complains can be submitted regarding:
1) Legal issues
2) The basis for examination (questions, assignments etc.)
3) The exam process
4) The assessment

- The complaint must be in writing and justified. Dissatisfaction with the grade without further justification does not suffice and does not qualify as a justified complaint. Complaints without sufficient justification will be rejected without being handled.
Complaints must include the student’s name, address, student ID number, and course number of the relevant course. The complaint must be submitted using the student email (sxxxxxx@student.dtu.dk) to the Office for Study Programmes and Student Affairs via email to studenterklager@dtu.dk.

The Office for Study Programmes and Student Affairs forwards the complaint to the examiner and, if relevant, the co-examiner, who submit a statement on the assessment and all of the student’s objections.

The assessors’ statement is then forwarded to the student, who has one week to comment on the statement.

A decision on the matter is made by the Office for Study Programmes and Student Affairs on the basis of the assessors’ statement and the student’s comments, if any, and may be one of the following:

1) Offer of a reassessment (new assessment) by new assessors – however, this type of ruling is not possible in connection with oral exams
2) Offer of a re-exam (new exam) assessed with new assessors
3) The student’s complaint is not upheld.

If the student is offered a reassessment or re-exam, the student has two weeks to accept the offer. The student must be aware that a re-exam and a reassessment may result in a lower grade. It is not possible to complain about the assessment of a re-exam or a reassessment unless the complaint concerns legal issues.

If the student’s complaint is not upheld, the student has the possibility of appealing against the decision. The appeal must be filed within two weeks of announcement of the decision. It must be justified in writing and submitted to studenterklager@dtu.dk using the student email address. The decision is made by a board of appeals of 4 members appointed specifically to make a decision on the matter, comprising two external examiners, a lecturer, and a student within the relevant subject area. The decision of the board of appeals may be 1) to offer a reassessment by new assessors (however, not in connection with oral exams), 2) to offer a re-exam with new assessors, or 3) that the student’s appeal is not upheld. The board of appeals is in no position to lower or higher the student’s grade. The decision of the board of appeals cannot be further appealed with respect to academic issues.

### 3.11 Exam certificate/diploma

When a student has completed a study programme at DTU, DTU issues an exam certificate/diploma. The exam certificate/diploma lists all the exams which the student has passed within the student’s curriculum.

The exam certificate/diploma is dated with the date on which the study programme ended:

- If the final element is a BEng project, a BSc project, or an MSc thesis, the exam certificate/diploma will be dated with the date of the oral presentation.
- If the final element is a course, the exam certificate/diploma will be dated with the date on which the last course was assessed.

The exam certificate/diploma will be sent to the student’s registered address no later than two months after the end of the study programme (however, not including July).
Students who are disenrolled from a study programme at DTU without having completed it will receive documentation for any successfully completed parts of the programme stated in ECTS credits.

4. Credit Transfer, Studying Abroad, Exemption, Leave, etc.

Credit transfer from previously non-completed study programmes at the same level (pre-commencement credit transfer)

Upon admission to DTU’s BEng, BSc, and MSc programmes, students are obliged to apply for credit transfer for passed programme elements (courses etc.) from all previous non-completed study programmes at the same level. This may, for example, be the case if an applicant to a BSc programme has previously been admitted to another BSc programme without having completed the programme.

If it is deemed that credit transfer for programme elements can be granted to the mandatory parts of the programme, students will be granted credit transfer. If it is deemed that credit transfer for programme elements can be granted to the elective parts of the programme, students can decide whether they want credit transfer. A credit transfer cannot be withdrawn once it has been granted. If students do not submit an application for credit transfer for previously passed programme elements at the same level or submit incorrect or incomplete information thereon, DTU may withdraw its offer of a place on the study programme.

In addition it is possible for students who wishes so to apply for credit transfer for programme elements from previous completed study programmes at the same level.

For students admitted from the summer 2017 it applies for the BEng and BSc programmes that courses must be at professional bachelor or BEng level as a minimum. For the MSc programmes the courses must be at MSc level as a minimum.

BEng students who have completed a higher education programme in technical sciences prior to admission can apply for credit transfer for parts of the programme, provided that an established credit transfer agreement has been concluded. For information on current established credit transfer agreements, please send an email to merit@adm.dtu.dk.

When granted a pre-commencement credit transfer, students can still obtain a diploma from DTU even though credit transfer has been granted for more than half of the programme.

Exam attempts
Students who are admitted to DTU via the coordinated enrolment system (KOT) and who have used exam attempts on failed courses they have previously attended at DTU on another study programme will automatically be assigned three new exam attempts on the relevant courses if these courses may be included in the study programme to which the student is now admitted.

Non-transferrable programme elements
Students cannot be granted transfer of credits from the qualifying programme/exam.

It is not possible to transfer a master thesis from one MSc programme to another.
Study activity requirements and programme deadlines in relation to pre-commencement credit transfer

Students who have been granted pre-commencement credit transfer must still comply with the study activity requirement (30 ECTS credits in the first year of study and 45 ECTS credits in each of the following years of study). The number of transferred ECTS credits will not be deducted from the study activity requirement.

The maximum duration of study is reduced with one semester for each 30 ECTS credits the student has been granted in pre-commencement credit transfer.

The first-year exam is reduced corresponding to the student’s pre-commencement credit transfer.

4.2 Credit transfer during the study programme

Credit transfer means replacing elements forming part of the student’s study programme at DTU by courses or exams passed at another Danish or foreign educational institution. DTU may grant credit transfer upon submission of an application.

Courses must be ‘passed’, ‘approved’, or awarded at least the grade 02 on the 7-point grading scale in order to be transferred to the programme.

For BEng programmes, transferred courses must be at BEng level as a minimum, i.e. from an engineering college, a university college, or a university.

For BSc programmes, transferred courses must be at university level.

For MSc programmes, transferred courses must be at MSc level. MSc students, however, are entitled to take 10 ECTS credits at BSc level in the course of the MSc programme. BSc level courses always form part of the electives group.

BEng and BSc students must as a minimum pass courses and projects at DTU corresponding to 90 ECTS credits (BEng Arctic Technology: 105 ECTS credits and BEng Global Business Engineering: 120 ECTS credits) to receive a diploma for a full-time study programme at DTU. This rule does not, however, apply to pre-commencement credit transfer.

MSc students must as a minimum pass courses and projects at DTU corresponding to 60 ECTS credits to receive a diploma for a full-time study programme at DTU. This rule does not, however, apply to pre-commencement credit transfer.

As a rule, courses that will make students exceed the prescribed ECTS credit total of the DTU study programme cannot be pre-approved or transferred. In some cases, however, the amount of ECTS credits transferred are not exactly the same as the size of the courses at DTU. In these cases,
students may register for a final course of up to 5 ECTS credits – even if this means exceeding the prescribed ECTS credits total of the programme in question.

4.2.1 Choice of courses
As regards credit transfer, a distinction is made between specific engineering courses and general engineering courses. Courses that do not have technical-scientific content, but fall within the learning objectives of the study programme, are categorized as general engineering courses. Students may earn the following number of ECTS credits within the general engineering course category:

- 15 ECTS credits on the BSc programme
- 10 ECTS credits on the MSc programme

Language and culture courses can only be approved in connection with study abroad semesters and may not exceed 5 ECTS credits. Such courses are always transferred as BSc credits and are therefore included in the maximum of 10 ECTS credits at BSc level which MSc students are allowed to take as part of their programme. For BSc and MSc students, they are considered part of the general engineering courses as described above. For BEng students, they are considered part of the elective courses. Only language and culture courses related to the country in which the student is on the exchange can be transferred. English language courses cannot be transferred to the programme. Pre-commencement credit transfer for language and culture courses will not be granted.

A Master thesis cannot be transferred to the MSc programme at DTU. Further rules regarding the Master thesis are stated in the programme specifications for the said MSc programme. Find the generic rules on master thesis at DTU Inside under ‘Master thesis’.

4.2.2 Pre-approval of credit transfer
Students must apply for pre-approval of credit transfer for planned programme elements from another university or another institution of higher education in Denmark or abroad. By applying, students give their consent to DTU requesting the necessary information from the host institution if the students are unable to procure the documentation themselves.

The pre-approval of credit transfer is registered as a course registration and ensures that students are registered as studying actively during the semester in which they are not registered for courses at DTU due to study stays etc. elsewhere. If the pre-approved courses, which the student is taking at the host university, change during the semester, the student must submit a new application for a pre-approval of credit transfer. Each application must include a complete list of courses taken at the host university.

4.2.3 Final credit transfer
All passed courses and ECTS credits must subsequently be transferred to the study programme. Therefore, students cannot apply for credit transfer for some of the passed courses or ECTS credits only. A credit transfer cannot be withdrawn once it has been granted.

In connection with credit transfer for completed programme elements from another educational institution, the grade ‘Pass’ will appear on the student’s DTU diploma.

4.2.4 Submission of applications
Applications for pre-approval of credit transfer and final credit transfer are submitted electronically via www.merit.dtu.dk. Other enquiries regarding credit transfer are sent to merit@adm.dtu.dk via the student email.

Applications must include course description, documentation of level, and workload. As regards final credit transfer, applications must also include documentation of passed and failed courses. In addition, an official description of the grading scale, according to which the course is assessed, must be enclosed.

4.2.5 Decision-making authority
The exemption committee for the BSc and MSc programmes (CMDU) and the exemption committee for the BEng programmes (DMDU) have authorized the heads of studies and the Office for Study Programmes and Student Affairs (AUS) to make decisions in cases related to credit transfer.

A decision on credit transfer is not valid until a written decision has been issued to the student by the Office for Study Programmes and Student Affairs (AUS) via www.merit.dtu.dk.

4.2.6 Students who have completed MSc courses on their BSc programme
Students who, as part of their qualifying exam, have passed a course or otherwise acquired academic knowledge and competences corresponding to courses in either the general competence group or the technological specialization group for the MSc programme must take a different course that contributes to the overall learning outcomes of the programme in question.

If the course in question belongs to the general competence group, students must choose a different course from the general competence group or the technological specialization group. In the latter case, students must contact the Student Services at studieservice@adm.dtu.dk.

If the course in question belongs to the technological specialization group, students must choose a different course in the technological specialization group.

If it is not possible to choose a different course in line with the above rules, students must obtain approval from the head of studies to take a different course that supports the academic profile of the study programme. The head of studies contacts the Student Services.

Use of aids and materials at written exams

Exam assignments must generally be formulated in such a way that prevents them from becoming an aids and materials exam. Emphasis must be placed on testing the students’ academic knowledge at the time of the exam.

Students must not gain unauthorized access to information during the exam, including using the Internet. Therefore, students are not allowed to bring mobile phones etc. The exam paper submitted must be prepared during the exam.

Calculators, computers, and other electronic aids must not be set up in a way that enables communication with others inside or outside the exam room.

Aids and materials permitted at exams are specified in the course description. There are three options:
1. No aids and materials permitted (except from standard dictionaries and calculators)
2. Written materials permitted (i.e. books, notes, old take-home assignments, etc. but not technical aids, for instance a laptop)
3. All aids and materials permitted (i.e. a standard laptop, tablet, or similar in addition to written materials).

Students are always allowed to bring standard dictionaries, i.e. spelling dictionaries, contemporary language dictionaries, and other language dictionaries, but not, for example, technical or medical dictionaries. This does, however, not include language exams where dictionaries are not permitted.

Students are always allowed to bring a calculator, unless the department forbids the use of calculators or makes one available at the exam. The department can make computers available at the exam, in which case students are not allowed to bring their own computer.

Students are not allowed to use their own printer at the exam.

Violation of the rules of using of aids and materials at written exams can lead to disciplanary measures towards students according to the rules regarding cheating at exams. Find more information on this at DTU Inside under 'Cheating at exams and other forms of assessment' under 'Exam'.

Students are responsible for any aids and materials they bring to the exam, and DTU generally does not make any type of facilities available for their use. Students are not granted extra time if the aids they have brought to the exam have a malfunction, are out of power etc.

It is possible to apply for special conditions at a written exam and thus obtain permission to use compensating aids (e.g. assistive aids for dyslexics) for written exams, where aids are otherwise not permitted. (See 'Special arrangements at written exams' under 'Exam')

Cheating at exams and other forms of assessment

DTU has established principles for good scientific and ethical conduct/practice at DTU, which, among other things, state that through their projects and conduct during courses, students must show that they have understood the principles of good scientific practice. DTU's principles for good scientific conduct can be found at DTU Inside under 'Research' and 'Principles for good scientific conduct'.

As of the academic year 2017/2018, DTU has introduced an Honour Code for exams. At the beginning of their studies, students must actively express their acceptance of the code in order to continue their studies at DTU. Acceptance of the Honour Code is a part of the commencement of studies exam for newly admitted BEng and BSc students. Newly admitted MSc students must express their acceptance of the code in connection with registration for courses in the 1st semester. More information on DTU's code of honour can be found at DTU Inside under 'Structure and Rules'.

Thus DTU requires that students at DTU demonstrate independence in their work, and that the exam always reflects the students’ own work.

Cheating at exams and plagiarism

DTU considers it cheating if students at an exam hand in work which they have not independently produced at the exam in question, if students use prohibited aids and materials at an exam, if students gain unauthorized access to information during the exam through other students or
by using the Internet, or if students demonstrate academic dishonesty, for example by manipulating or falsifying data. DTU also considers it exam cheating if a student helps another student violate the exam rules.

Written assignments may only be submitted for assessment once. Written assignments previously assessed at DTU or another educational institution may not be reassessed, regardless of the grade earned and whether the assignment is the result of the student’s own previously submitted work.

At DTU Inside under ‘DTU’s code of honour’ under ‘Structure and rules’, examples are provided of violations of exam rules as well as guidance on the basic rules for quotes and source references in written assignments.

**Procedure in case of cheating at exams**

In accordance with section 9 of the Examination Order, DTU has laid down rules on disciplinary measures in cases of cheating and disruptive behaviour at exams (see ‘Disciplinary measures’ under ‘Structure and rules’ at DTU Inside). Violation of the exam rules will thus result in disciplinary sanctions against the student.

If there is any suspicion of violation of the exam rules, the lecturer must notify the Office for Study Programmes and Student Affairs via eksamenssnyd@adm.dtu.dk.

Following consultation of the student suspected of violating the rules, the Office for Study Programmes and Student Affairs makes a decision on the matter. If the student maintains that there are legal discrepancies in the decision, the student can appeal to the dean of the relevant programme within two weeks of receiving the decision.

The Office for Study Programmes and Student Affairs can choose to cancel an exam and request the student to resit the exam if there are reasonable grounds for suspicion of irregularities in connection with the student’s exam paper which strongly indicate that the student’s achievement of the current learning objectives cannot be assessed on the basis of the exam. The exam form in connection with the new exam may differ from the exam form at the ordinary exam. Exams which are cancelled due to suspicion of irregularities are not considered an exam attempt.

If the new exam confirms suspicions of cheating, a decision is taken in accordance with DTU’s rules regarding disciplinary measures for students.

If the new exam does not confirm the suspicions of cheating, the decision is taken the student cannot be deemed to have violated the exam rules. The student is assessed based on the performance at the new exam.

**3.5 Special exam arrangements**

**3.5.1 Special arrangements at written exams**

The Office for Study Programmes and Student Affairs may allow special exam arrangements at written exams within the ordinary exam periods for:

1. Students with physical or mental impairment (e.g. physical disability, dyslexia, etc.). The impairment must have a significant impact on the student’s potential exam performance.

2. Students in their first year of study in Denmark whose native language and qualifying exam are not Danish, provided that the exam is in Danish only.
3. Students with similar difficulties, for instance students who are in the last month of pregnancy or who are breastfeeding an infant.

The reason for granting special arrangements must always be documented. Exam stress is not a valid reason for allowing special arrangements.

The following is considered valid documentation: a) dyslexia test, b) a doctor’s note from your own GP or a consultant describing the applicant’s study/exam-related challenges, c) documentation for a non-Danish qualifying exam (if applying on the basis of first year of study in Denmark), and d) a pregnancy journal (if applying due to pregnancy/birth).

For special exam arrangements to be allowed, the Office for Study Programmes and Student Affairs must deem this to be necessary to ensure that the student is examined on equal terms as the other students. It is a precondition for allowing special exam arrangements that the academic level of the exam is not lowered.

Applications for special exam arrangements must be submitted to aus-sps@adm.dtu.dk by 1 November at the latest for winter exams, by 15 April at the latest for summer exams, and by 15 June at the latest for re-exams in August. The application form can be found here at DTU Inside. In the case of emergencies (e.g. a broken arm), students can apply after the deadline by writing to studieservice@adm.dtu.dk.

Students with permission to use their own computer can make a request to have non-digital exam assignments handed out on a USB-stick. The deadlines for this request can be found on DTU Inside. If you wish to hand in your exam assignment on a USB-stick you must inform your lecturer beforehand.

If you want to apply for special arrangements at written exams outside the ordinary exam periods, you need to refer to the conditions for oral examinations (see section 3.5.2), because these exams are administratively handled by the departmental course coordinators.

3.5.2 Special arrangements at oral exams
The course coordinators may allow special arrangements at oral exams.

The circumstances which form the basis for allowing such special arrangements must be documented. Exam stress is not a valid reason for allowing special arrangements.

The following is considered valid documentation: a) dyslexia test, b) a doctor’s note from your own GP or a consultant describing the applicant’s study/exam-related challenges, c) documentation for a non-Danish qualifying exam (if applying on the basis of first year of study in Denmark), and d) a pregnancy journal (if applying due to pregnancy/birth).

For special exam arrangements to be allowed, the course coordinator must deem that it is necessary to ensure that the student is examined on equal terms with the other students. The Office for Study Programmes and Student Affairs can assist the course coordinators in making this assessment as required. It is a precondition for allowing special exam arrangements that the academic level of the exam is not lowered.

In order to apply, the student must contact the course coordinator no later than one month before the oral exam in order to secure an agreement.
3.6 Illness in connection with exams

Students who are unable to participate in an exam or who have to leave an exam due to illness must, no later than two weeks following the date of the exam, send documentation of the illness to the Office for Study Programmes and Student Affairs through student mail to studieservice@adm.dtu.dk. If this procedure is followed unattended exams during the period of illness will not count as exam attempts. The student in question must bear the expenses for the medical certificate.

Students who become ill during the exam must notify an invigilator or examiner before leaving the exam.

If a student choose to complete an exam despite not feeling well, it will count as an exam attempt.

Students must contact the doctor on the day of the exam or the proximate weekday at the latest.

It is the students’ responsibility to register for a new exam attempt in the same course.

If a student is unable to comply with one of the deadlines specified for the programme due to documented illness, the deadline will be extended until the next (re)-exam is held in the course in question without the student having to submit an application. If the student remains ill at the next exam in the course, the student must submit an application for an exemption to have the deadline extended again. However, the above does not apply if a deadline is granted through exemption. This also apply if an exam attempt has been granted through exemption in order to be used before an exact deadline. In such cases, students must immediately apply for exemption for a renewed postponement of the deadline.

If a student is unable to participate in an exam due to severe illness of a family member or friend, or in case of a serious event that may affect the student’s performance at the exam, the student can apply for cancellation of the exam by submitting relevant documentation to the Office for Study Programmes and Student Affairs via student mail to studieservice@adm.dtu.dk. If the student has already completed the exam, it will count as an exam attempt, and the exam cannot be cancelled.

If a student falls ill while completing the final project (BEng project, BSc project and MSc thesis) the rules in the students programme specification apply. See ‘My programme specification’.

3.7 External examiners and confidentiality

All external examiners used at DTU must be members of the nationwide engineering examiner corps (www.censornet.dk).

The external examiners’ activities are covered by the Public Administration Act, including the provisions on disqualification and secrecy.

The course description specifies whether a course is assessed by an external examiner or as an internal examination. Final projects are always assessed by an external examiner.

Projects which, entirely or partially, are carried out with private companies, may, taking into account any information about trade secrets, know-how etc., be treated as confidential, which means that the oral presentation will not be open to the public. It may be agreed that the report must not be made publicly available.
3.8. Deadlines for grading

Exams in 13-week courses:
No later than 20 work days after the day of the exam.

3-week courses:
No later than 20 work days after the last day of the 3-week period.

Engineering internship:
No later than 20 work days after the submission date of the report.

BEng project/BSc project/MSc thesis
The grade is awarded in connection with the oral exam. The oral exam must be held no later than 10 work days after submission of the written report.

In exceptional circumstances, the head of department can approve a later exam date.

2.8 Evaluation of teaching

At the end of the semester, the teaching in all courses are evaluated via DTU Inside. The students complete the evaluation forms anonymously. Evaluations are processed by the board of studies at the department.

The evaluation of a course comprises three forms:

Form A: Evaluation of the course in general
Form B: Evaluation of the course coordinator/lecturers
Form C: Free-text proposals (text fields where students can give praise or criticism in their own words)

Form A is available to everyone. A summary of the course evaluations is published on DTU’s homepage.

Forms B and C are confidential as they may contain sensitive personal information. The evaluations may, however, be accessed by the following persons:

- The relevant head of department and managers with direct HR responsibility
- All members of the relevant board of studies
- The course coordinator
- When the course comprises a mandatory element of the programme, the relevant head of studies.

2.10 Complaints regarding teaching and supervision

Students who are dissatisfied with the teaching in a given course or with the supervision received in connection with a project must contact the lecturer/supervisor concerned immediately to find a
solution to the problem. If this does not solve the problem, the following rules for complaints regarding teaching/supervision have been established:

- Complaints must be justified in writing and submitted to the board of studies at the department offering the course within two weeks of the announcement of the student’s grade. A list of study board chairmen at the individual departments can be found on DTU Inside under ‘Study board chairmen’.

- The department board of studies informs the head of department about the complaint if the complaint concerns issues relating to personnel, and makes sure that the lecturer/supervisor gets the opportunity to comment on the complaint.

- As soon as possible after the consultation of the lecturer/supervisor, the department board of studies forwards the decision to the student, and a copy is provided for the head of department.

- If the student’s complaint is upheld, the head of department, based on the decision of the department board of studies, will decide on any measures that need to be taken with regard to the lecturer/supervisor.

- The decision must contain the grounds for rejection and a procedure for complaints, in case the student’s complaint is not fully upheld, see below.

- If the student does not accept the decision of the department board of studies, the student can file a complaint to the dean of the programme in question no later than two weeks after the student has received the decision. The complaint must be justified in writing and submitted via student email to the Office for Study Programmes and Student Affairs to studenterklager@dtu.dk. The complaint must be accompanied by the documents included in the original complaint to the department board of studies.

- The decision of the dean is final unless any procedural errors have been made. If the student believes that there are procedural errors in the dean’s decision, the student in question can appeal to the Danish Agency for Science and Higher Education. The appeal must be filed within two weeks of announcement of the dean’s decision. It must be justified in writing and submitted to the Office for Study Programmes and Student Affairs (studenterklager@dtu.dk) who forwards the appeal to the Agency.

2. Study Programme Rules

The study programmes at DTU consist of courses which include lectures, seminars, classes, practical exercises, projects, etc. A course can have a duration of more than one teaching period.

The academic year is divided into six teaching periods. Two 13-week periods in the autumn and spring semesters, respectively, each followed by an exam period of about two weeks, and four 3-week periods followed by exams in January, June, July, and August, respectively.

The order and scheduling of mandatory courses, academic content, teaching and working methods, as well as any prerequisites are specified in the programme specifications for each study programme.
and the individual course descriptions. Mandatory study elements can generally not be taught in July/August exclusively.

BEng and BSc courses are usually taught in Danish, except for courses on the English-language BSc programme in General Engineering. A limited number of courses can be offered in English on other BSc and BEng programmes.

All MSc courses are taught in English.

Sound- or video recording of teaching sessions at DTU are not allowed unless the teacher has approved this in writing. Recordings are only for personal use unless the teacher has allowed publication of the recording, including what kind of publication.

Lectures at DTU are generally open to the public. A teacher can, however, deny access to the public due to considerations of space or order and can hence reject listeners who are not registered for the course. Only students registered for the course may participate actively in the class.

3. Exam rules

Each course and project concludes with an exam. The objective of the exam is to assess the extent to which the student meets the learning objectives defined for the course or project. The exam must reflect the overall course objectives, learning objectives, and content.

Type of assessment, date of examination etc. can be found in the course descriptions at DTU Course Base.

3.1 Registration and withdrawal

All approved course registrations are automatically transferred to exam registrations at the end of the supplementary registration period. Students are responsible for all other exam registration.

Students’ exam registrations can be found at DTU Inside in the tab ‘Toolbox’ under ‘Course registration’. Here students can also withdraw exam registrations and register for other exams if he/she wish to participate in the exam in other/more courses than those transferred from the course registrations, for example re-exams.

Registration is binding after the deadline for exam withdrawal, and an exam attempt has been used even if the student does not participate in the exam.

Even if a student has passed one or more part-exams in a course, this does not count as an exam attempt if the student withdraw from the exam within the current deadlines. The student must pay attention to the rules for part-exams in connection with re-exams. These rules can be found at DTU Inside under ‘Re-exams’, ‘Exam’.

Students must register for and withdraw from any subsequent second or third exam attempt within the current deadlines. Similarly, students who have withdrawn from their first exam attempt in a course, must register for a new exam in the course unless they register for the course once more.

Students can find the deadlines for exam registrations etc. on DTU Inside under ‘Registration deadlines for courses and examinations’ under ‘Exam’. 
The students are responsible for ensuring that they are registered for the right exams.

Students cannot register for exams in courses which have already been passed (grade 02 or higher or ‘Pass’).

If, after the publication of the dates for written exams, it transpires that a student has registered for two exams which overlap, the student is entitled to withdraw from one of the written exams and instead take the exam in question in the next (re-)exam period. The same applies to oral exams if the student is unable to arrange a different time of examination for the oral exam with the examiner. The above also applies if two re-exams overlap. The student shall contact the Office for Study Programmes and Student Affairs through studieservice@adm.dtu.dk.

**Exam attempts**

Students are entitled to three exam attempts in each course or project.

Even though several versions of the same course with different course numbers may be available, students only have three exam attempts. This also include one or more exam attempts used under vacant place scheme (vacant place on DTU’s courses offered to students as a part-time programme). Several versions of the same course both cover courses with different course number and/or title and courses that are not applicable with other courses.

Students who do not pass a third exam attempt are obliged to apply for an exemption to be granted an additional exam attempt immediately after the announcement of the grade for the third exam attempt. If they fail to do so, they will no longer be entitled to be enrolled in the study programme. The Exemption Committee’s granting of a fourth exam attempt must take place at the next (re-)exam of the course. These rules also apply to students who do not pass a forth exam attempt etc.

All activities that form part of the programme must be assessed. To obtain an assessment, students must be registered for the exam in the activity. Students may not participate in an exam or have, for example, a substitution paper assessed if they are not registered for the exam in the course.

Students should be present at written exams (on-site exams) 15 minutes before the exam starts in order to be ready at the time when the exam starts. Students who show up after the exam has started will not be allowed to participate in the exam.

If students are registered for an exam after the deadline for withdrawal and they do not turn up at the exam, it is regarded as an exam attempt. This is also the case if students fail to submit and/or have not had mandatory assignments approved in order to qualify for exam participation.

For guest students and students in part-time programmes, special rules apply for exam registration. Find information on special rules for students in part-time programmes at DTU’s webpage.

BEng projects, BSc projects, and MSc theses also conclude with an exam, but registration is made via the project reporting system by the department with which the student is affiliated. (See ‘My programme specification’)

**Assessment forms and grading**

Students must be assessed individually. In connection with both individual exams and group exams, an assessment must be made of the performance of each individual student, and individual grades
must be awarded. For group projects, each individual student must be given his or her own grade or assessment; it is thus not possible to give a grade for the group as a whole.

In connection with their assessment, the external examiner and the primary examiner must take notes about the candidate’s performance and the grading for use in the event of a future appeal. The notes must be kept for at least a year and until the conclusion of any subsequent appeal.

At least 1/3 of the total ECTS credits on the study programme must have been completed with external co-examination. This does not apply to exams for which credits have been transferred from other universities.

The assessment consists of a grade based on the 7-point grading scale or the assessment ‘Pass’ or ‘Fail’. The assessment ‘Pass’ or ‘Fail’ can only be used for tests/exams accounting for up to one third of the study programme’s ECTS credits. This does not apply to exams for which credits have been transferred from other universities.

In cases where an assessment cannot be made in accordance with the Danish 7-point grading scale or ‘Pass’ or ‘Fail’, the following registration may occur:

- The registration ‘Ill’ (SYG) is used if the student has been registered for the exam without participating—or have had to leave the exam due to illness—and the student can present documentation for this (see ‘Illness in connection with exams’). It is registered that the students has not used an exam attempt.
- The assessment ‘Did not take exam’ (‘Ej mødt’ (EM)) is used if the student has been registered for the exam without taking the exam. It is registered that the student has used an exam attempt.
- The registration ‘Not approved’ (‘Ikke godkendt’ (IG)) is used when the student fails to meet requirements for submission of mandatory assignments as a prerequisite for taking the exam (see ‘Mandatory class participation and mandatory assignments’ under ‘Teaching’). It is registered that the student has used an exam attempt, unless the student withdraws from the course exam himself/herself.
- The registration ‘Cheating’ (SNYD) is used if the student has had an exam performance/result for a full course cancelled because of violation of the exam rules (exam cheating). It is registered that the student has used an exam attempt.

Exams may be written, practical, oral, or a combination of these, for instance a series of part-exams during the course.

In connection with the approval of course descriptions, the department board of studies decides on the form of assessment, including part-exams, to be used on the course.

Students must be assessed individually. In connection with both individual exams and group exams, an assessment must be made of the performance of each individual student, and individual grades must be awarded. For group projects, each individual student must be given his or her own grade or assessment; it is thus not possible to give a grade for the group as a whole.

In connection with their assessment, the external and the primary examiner must take notes about the candidate’s performance and the grading for use in the event of a future appeal. The notes must be kept for at least a year, and until the conclusion of any appeal procedure.

Requirements for passing exams and part-exams
An exam has been passed when the student has obtained the grade 02 or higher according to the 7-point grading scale or has obtained the assessment 'Pass'.

All mandatory activities in a course (except e.g. laboratory exercises which cannot be assessed and mandatory assignments which are a prerequisite for exam participation) must be included in the assessment.

A course comprising several part-exams can be assessed based on either an overall assessment or a weighted average of the part-grades. In connection with overall assessments, students only obtain one grade for the course. If students obtain part-grades they are informed of the grades regularly, and the final and overall grade is the weighted average of the part-grades, rounded up or down to the nearest grade on the 7-point grading scale.

The requirements for passing exams if part-grades are awarded are that 1) the average grade for part-exams must be at least 02 without rounding up, and that 2) no part-grade must be less than 00.

For some courses, it may be relevant to deviate from the above rule or to establish additional requirements for part-grades. Such deviations must be approved by department board of studies and the dean. The deviations must be stated in the course description.

If the student does not attend a part-exam for which a part-grade is given, the part-grade -3 will be awarded for the part-exam and included in the calculation of the overall grade for the course. The course will thus be assessed as not passed (i.e. -3), see above. This is also the case if a student does not attend an exam which is a prerequisite for making an individual assessment of a performance, such as a group project, as the student’s contribution to the group presentation cannot be established.

All part-exams in a course must be taken in the same course module, unless otherwise stated in the course description. Part-exams cannot be retaken if the course has been passed (see ‘Requirements for passing exams and part-exams’ under ‘Assessment form and grading’ under ‘Exam’).

Students can only file complaints regarding part-grades if a change of the part-grade will change the overall grade. A complaint regarding a part-grade can only be filed when the student has been notified of the grade.

**Individual assessment of group projects etc.**
The exam for a course may consist of written reports, posters, or similar. Such written work can be carried out individually or as group projects.

DTU recommends a maximum of six students for group projects in connection with courses. The individual course coordinator may decide on a maximum number which is lower or higher than six if appropriate from the point of view of the learning objectives.

Special rules apply regarding group size in the case of BEng projects, BSc projects, and MSc theses. (See ‘My programme specification’)

Group projects can be written in two different ways. The form of assessment depends on whether the project is individualized or not, see below.

For a group project, an independent grade or other assessment can only be awarded if the individual student’s contribution to the project can be ascertained (individualization). A group project is not deemed to be individualized if the students merely state, for example, that they have contributed
equally to all sections of the report, etc. It must be clearly indicated which sections each student is (primarily) responsible for.

Before the students commence a group project, the course coordinator must inform the students whether or not they are required to individualize the project. If a group project does not comply with the course coordinator’s requirements for individualization or other formal requirements, the paper may be rejected and no assessment given.

**a. Group projects without individualization**

A group project where the students’ individual contributions are not indicated must always be followed by an oral exam, as it is not possible to carry out an individual assessment on the basis of the group project alone. The assessment is then based on an overall assessment of the project and the subsequent oral exam. The oral exam can be either an individual exam (i.e. one student at a time) or an oral group exam. (See ‘Oral group exams’ under ‘Exam forms’ under ‘Exam’)

**b. Group projects with individualization**

Several students can contribute individual sections to a joint report. Provided that the students’ individual contributions are clearly distinguishable in the joint report, a subsequent oral exam is not required. It is accepted that general descriptive sections such as the introduction and the conclusion are prepared jointly. However, the most important sections in a group project must be individualized.

**Head of study**

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