Technical University of Denmark

Thomas H Christensen

Technical University of Denmark (DTU)

Founded in 1829 and the famous Danish scientist H.C. Ørsted was the first Rector.

In 2001, the Technical University of Denmark achieved financial autonomy and acted as the blueprint for the University Act governing all universities in Denmark passed by Denmark's Parliament in 2003.

On 1 January 2007, DTU merged with Risø National Laboratory, the Danish Institute for Food and Veterinary Research, the Danish Institute for Fisheries Research, Danish National Space Center, and the Danish Transport Research Institute.

The new Technical University of Denmark is a broadly founded, business-oriented technical elite university where research goes hand in hand with education, innovation and advisory functions for government authorities.

DTU

Strategy (2008-2013)

Strategic goals

DTU's academic degrees should **be recognized internationally** as being of a high standard of excellence and should be among the most prestigious degrees in Europe. *(Education)*

DTU should, within 3-5 well defined disciplines, be among **the world's leading universities**. *(Research)*

DTU should have a coherent system of innovation that stretches from research and education, over patenting and licensing, to industrial cooperation, business incubation, and actual research park activities. *(Innovation)*

Rankings

Times Higher Education, 2008

	Peer review 40%	Employer review 10%	Staff/ student 20%	Citation/ staff 20%	Interna-tional staff 5%	Interna-tional student 5%	Overall score	Ranking
DTU	45	42	99	63	90	56	63,4	**133**
KTH	59	58	47	46	70	98	57,8	**173**
TU	78	87	66	49	80	66	71,8	**78**
ETH	95	82	56	99	100	94	89,1	**24**
TU Einhoven	57	55	100	41	98	42	64,8	**128**
TU München	73	59	86	57	54	77	71,8	**78**

Leiden University in the Netherlands

CPP/FCSm=crown Indicator. International field- and document-normalized impact.
World average=1. Size disappears in the crown indicator.

How does a unit perform compared to all units in the world in that field. The average citation rate of a unit's papers divided by the world citation average in the subfields in which the unit is active.

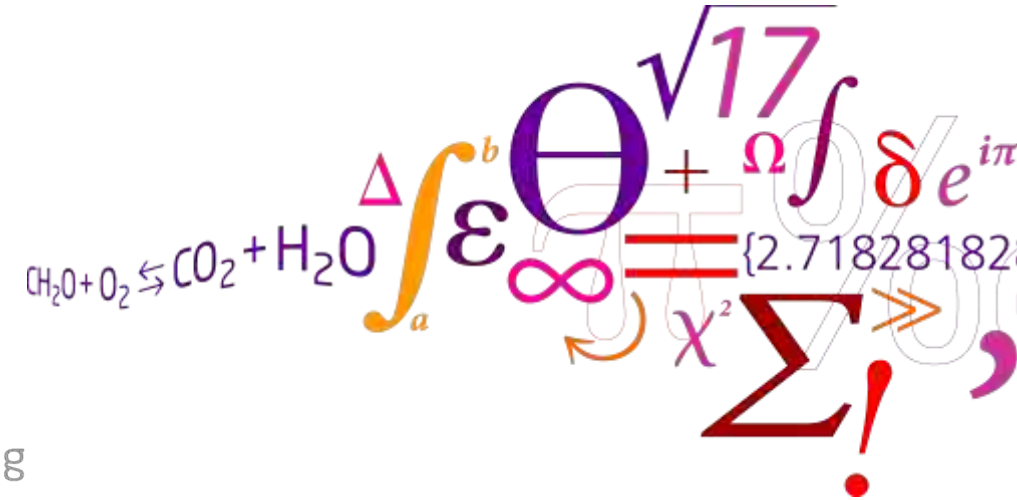
CPP=Output-normalized impact: Average number of citations per publication of the unit.
FCSm: Average number of citations per publication of all journals of a specific field in which the unit is active.

Rank	*Country*	*University*	*P*	*CPP*	*CPP/FCSm*
1	UK	UNIV OXFORD	35,979	11.94	1.69
2	UK	UNIV CAMBRIDGE	37,972	11.56	1.67
3	CH	ECOLE POLYTECN FEDERALE LAUSANNE	10,650	6.38	1.59
4	CH	ETH ZURICH	20,798	8.87	1.54
5	**DK**	**TECH UNIV DENMARK**	**10,474**	**7.54**	**1.52**
6	CH	UNIV LAUSANNE	10,676	12.38	1.50
7	UK	IMPERIAL COLL LONDON	29,829	10.06	1.48
8	NL	ERASMUS UNIV ROTTERDAM	16,09	10,81	1,47

DTU

MSc in Environmental Engineering at the Technical University of Denmark

Technical University of Denmark



DTU Environment
Department of Environmental Engineering

DTU Environment

Department of Environmental Engineering

- One of 24 academic departments at DTU
- 25 full time academic staff, 50 PhD students
- 110 full time researchers
- 100 ISI-indexed publications in 2008
- L.A.Colding, Professor of Sanitary Engineering gave the first lecture at the Copenhagen Polytechnic Institute in Environmental Engineering in 1865. He graduated from the newly formed Polytechnic in 1841.
- International MSc degree in English since 1996
- 18 Nationalities
- €10 million annual turnover (€6 million/yr external funding for research)

MSc in Environmental Engineering

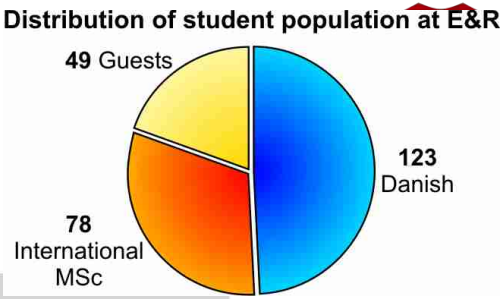
- Problem based learning
- Technical SOLUTIONS to environmental problems
- Process understanding (physical, chemical, microbial and organizational) is necessary in sustainable technology and management
- Multidisciplinary and geared towards practical applications
- Project & group work
- Variety of examination forms
- Opportunities for specialization

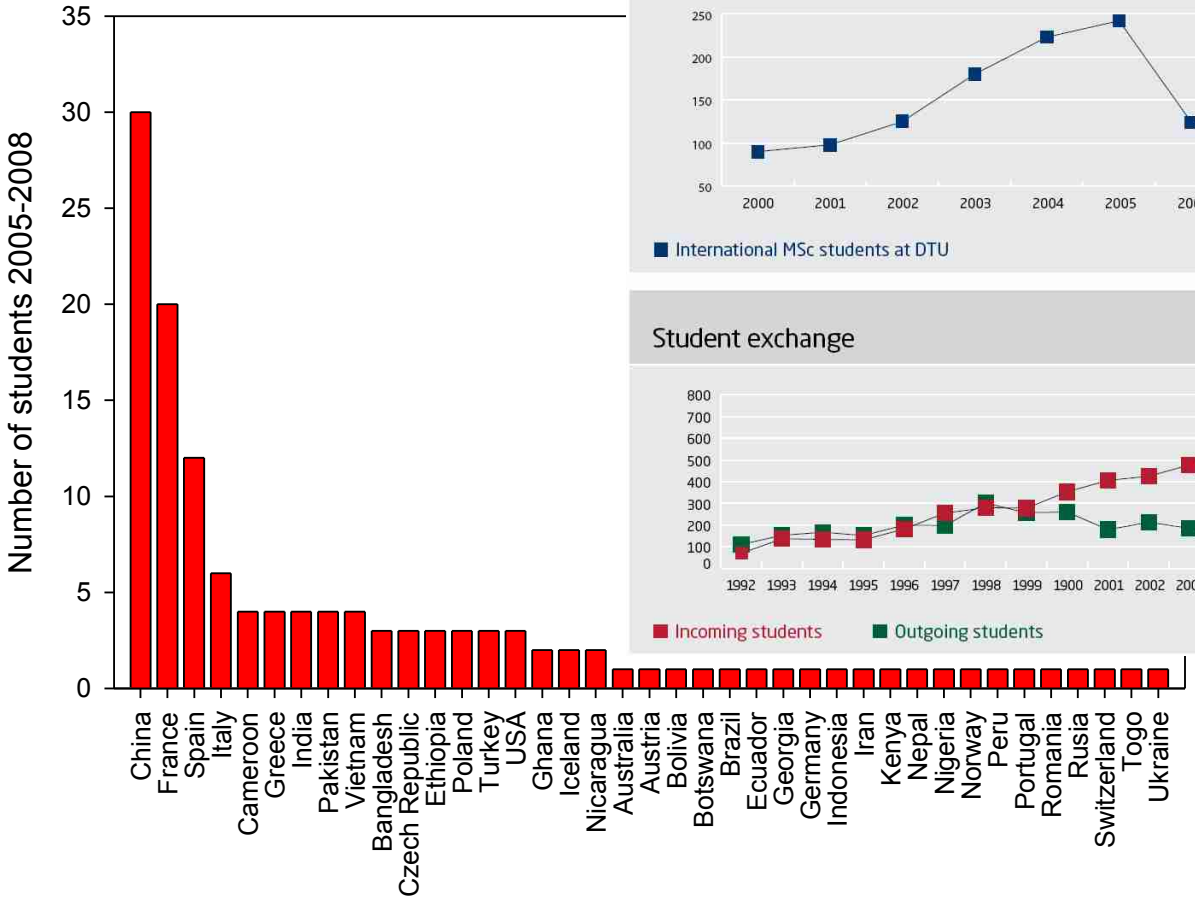
Key Figures for Teaching

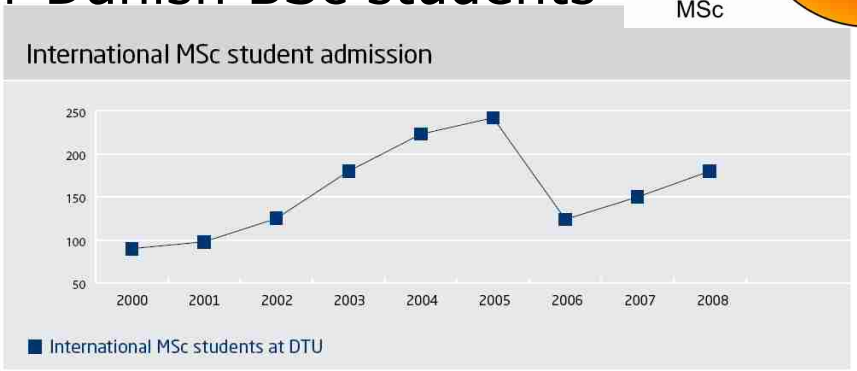
- Full time student equivalents (STÅ): 203
- Ratio of passed exams: ~80%
- Average number of ECTS taught per faculty member: 11
- Completion of teaching: 100%
- Student to faculty ratio: 9
- 42 courses, 9 PhD courses
- 55-70 MSc per year

Where do our students come from?

- 50% DTU BSc students
- 50% International students
- Small number of other Danish BSc students







The MSc in Environmental Engineering

- Programme in English – 2 years (120 ECTS)
- Consists of 4 elements - 30 ECTS points each

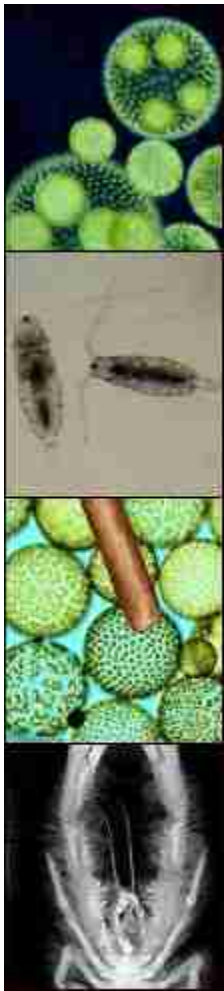
Master of Science in Engeneering = 120 ECTS credits	
General Competences 30 ECTS credits	Electives 30 ECTS credits
Technology Specialization 30 ECTS credits	Thesis 30 ECTS credits

General competence courses

Objectives

- To present environmental problems and solutions in a societal framework including economy, organisation and social factors
- To teach teamwork skills based on integrated project work
- To establish a common professional identity of the master programme

12104	Modelling of Environmental Processes and Technologies (10-E2)
12240	Environmental Management and Ethics (5-E1)
42XXX	Environment and Economics (5-E5)
12230	Risk assessment of chemicals for engineers (10-F1)



Technological Specialization courses

- Courses which aim at providing the student with specialized research based qualifications within a more narrow technical area
- Each defined study line under the programme suggests a group of technological specialization courses from which at least 30 ECTS points should be obtained

Technological Specialization Courses

02431 Risk Management (5-Jan)

12121 Water supply (10-F2)

12122 Urban drainage systems (5-june)

12130 Solid waste technology and management (10-E4)

12131 Waste water treatment (10-E3)

12132 LCA Modelling of Waste Management (5-jan)

12133 Environmental Biotechnology (5-F4)

12137 Experimental Environmental Microbiology (5-Jan)

9 Integrated Urban Water Quality Management (5-E4A)

12225 Air Pollution and Environmental Effects (10-E2)

12231 Applied analytical environmental chemistry (5-jan)

12233 Water pollution (10-E5)

12242 Environmental management in the tropics (10-E5)

12330 Contaminated Sites (10-F3)

12333 Integrated Water Resources Management (5-E2B)

12335 The Groundwater Resource (10-E4?)

12341 Surface water hydrology (10-E4)

12421 Environmental Geology (5?-E2A??)

12600 Nano Technology and the Environment (5-June)

42372 Life cycle assessment of products and systems (10-E1)

42470 Introduction to Industrial Environmental Management (5-E4)

42542 Management of Environment and work env. (5 F4B)

42273 Urban Planning and Sustainable Urban Development (10-F3)

Elective courses

Courses chosen among the DTU courses or external master courses from other universities (with credit transfer to DTU) and can be of different nature:

on-programme courses to obtain scientific skills on an advanced level (statistics, computation, advanced chemistry, microbiology, etc)

dditional technological specialization courses or other courses with the objective to obtain further specialization within a selected area or to broaden the environmental scope of the study plan further

achelor DTU courses with the objective of obtaining basic skills not original obtained in the qualifying bachelor degree (Max 10 ECTS)

MSc Thesis project

0-50 ECTS points (additional points over 30 points part of elective course block)

an be carried out in collaboration with an external institution

hould always incorporate elements of research

MSc thesis and projects:

- 90 MSc thesis students (75 projects)
- 80 students attending tailor made special courses

Study lines

- Urban Water Engineering
- Water Resource Engineering
- Residual Resource Engineering
- Environmental Chemistry and Microbiology
- Environmental Management (at DTU Management)

Urban Water Engineering

Water Supply Engineering:
Water treatment, processes in water distribution systems, materials, water quality and public health

Urban Water Management:
Modelling and simulation of urban water systems; climate change impacts and adaptation; technologies for source control and treatment; identification, characterization and monitoring of priority pollutants; integrated urban water management

Wastewater Technology:
Domestic and industrial wastewater treatment, biological process modeling and control, fate of specific organic pollutants, sustainable wastewater handling and impact assessment, microbial ecology in wastewater treatment processes

Water Resources Engineering

Hydrology

Integrated water resources management, catchment hydrology, subsurface hydrology, hydrogeophysics and remote sensing in hydrology, computational methods in water resources

Geochemistry

Redox processes in aquatic systems, iron geochemistry, sorption geochemistry including modeling, diagenesis of sedimentary rocks, minerals and mineral deposits

Geophysics

Properties of sediments and sedimentary rocks, sedimentary rocks as reservoirs for hydrocarbons and water, CO2 sequestration

Contaminated sites

Characterisation and risk assessment, fate and transport, modelling of pollutants, natural attenuation, remediation technologies.

Residual Resources Engineering

Solid Waste

Waste characterization and analysis, thermal waste treatment /incineration, organic waste/composting/digestion, landfilling, environmental assessment (LCA-models / GHG-accounting)

Bioenergy

Biogas processes, biohydrogen (pure and mixed-culture), anaerobic microbiology, microbial fuel cell (lignocellulosic waste to energy), biorefinery (integrated production of food, energy carriers, and other useful by-products).

Environmental Chemistry and Microbiology

Ecotoxicology and Environmental Chemistry

Fate and effects of chemicals, hazardous materials and complex mixtures, predictive risk assessment tools, prevention of adverse effects in the environment.

Environmental Analytical Chemistry

Chemical and physical analytical tools, identification, quantification and characterization, surface charge and size distribution.

Microbial Ecology

Microbial occurrences, processes and interactions, biodegradation of unwanted substances, pathogens.

Nanotechnology & Risk

Environmental risks of engineered nanomaterials, laboratory experiments, fate and ecological impact

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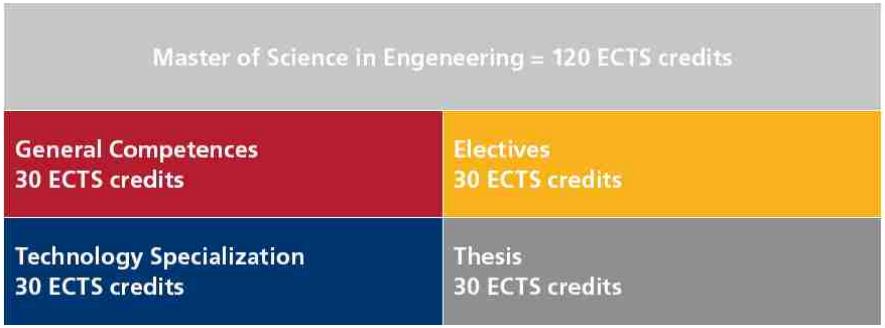
Study Lines

An optional extra diploma

Students must complete 30 ECTS Technological Specialisation courses from within study line.



Urban Water Engineering	Water Resources Engineering	Residual Resources Engineering	Environmental Chemistry and Microbiology	Environmental Management
12121 Water supply (10-F2) 12131 Waste water treatment (10-E3) 12122 Urban drainage systems (5-june) 12140 Integrated Urban Water Quality Management (5-E4A) 12233 Water pollution (10-E5)	12341 Surface water hydrology (10-F4) 12335 The Groundwater Resource (10-E4) 12330 Contaminated Sites (10-F3) 12333 Integrated Water Resources Management (5-E2B) 12421 Environmental Geology (5?-E2A??)	12130 Solid waste technology and management (10-E4) 12133 Environmental Biotechnology (5-F4) 42372 Life cycle assessment of products and systems (10-E1) 12135 LCA Modelling of Waste Management (5-jan) 12225 Air Pollution and Environmental Effects (10-E2)	12233 Water pollution (10-E5) 12231 Applied analytical environmental chemistry (5-jan) 02431 Risk Management (5-Jan) 12225 Air Pollution and Environmental Effects (10-E2) 12137 Experimental Environmental Microbiology (5- January?) 12600 Nano Technology and the Environment (5-June)	12242 Environmental management in the tropics (10-E5) 42542 Management of Environment and work env. (5 F4B) 42470 Introduction to Industrial Environmental Management (5-E4) 42273 Urban Planning and Sustainable Urban Development (10-F3) 42372 Life cycle assessment of products and systems (10-E1)

The Solid Waste group

- Thomas H Christensen. Prof.
- Charlotte Scheutz, Assoc. Prof.
- Thomas Astrup, Assoc. Prof.
- Peter Kjeldsen, Prof. (< ½ time)
- 1 senior researcher
- 2 post-docs
- 10 PhD students
- On-request technician

Master thesis in Solid Waste: 2007-2009

- Waste taxation and environmental performance of waste management systems
- Environmental assessment of WEEE management
- Environmental benefits of waste prevention
- Quantifying environmental performance of waste management in six European countries
- Comparison of waste management systems wrt environmental performance and resource recovery
- LCA modelling of mechanical-biological waste treatment systems
- Biocovers for landfills (methane oxidation)
- Quantifying air emissions from waste composting
- A method for quantifying methane potential of solid waste types
- Packaging waste in Europe
- Demolition waste: management and LCA modeling
- Material based LCA of landfilling.
- Capital cost in waste management
- Heavy metals in ashes from waste incineration
- LCA on low-temperature pyrolysis
- Reduction of methane emission from landfills
- Degradation of HCFC-141b released from insulation foam in landfills.
- LCA on landfilling of MBP waste

Typical solid waste master student:

- 30 ECST competence classes
- 30 ECTS technical competences + 30 ECTS electives
  - 10 Solid waste
  - 10 LCA-modelling
  - 5 LCA and solid waste
  - 10 Contaminated sites
  - 10 Air pollution
  - 5 Field work on contaminated site
  - 10 Biotechnology (new from fall)
  - 5 on a special course
- 30 on thesis

Employment of masters in solid waste
(RRE: 5-10 M.Sc. in solid waste, 5-10 M.SC. in Bioenergy)

- Municipalities
- Central administration, e.g. Danish EPA
- International organizations, e.g. European Topic Center on Waste
- Waste companies
- Utility companies
- Consultants
- Technology manufactures
- Go back to their home-country
- Go into research as PhD students; graduates employed as above plus in academia

Where do our graduates work?

Universidade de Vigo

DTU

Poliedra

Università degli Studi di Roma "Tor Vergata"
Dipartimento di Ingegneria Civile
Viale del Politecnico 1 00133 Roma

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Technical University of Denmark

DTU Environment
Department of Environmental Engineering

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Education

Here you will find information about our bachelor & master program in the field of environment & resources, along with information for international students, and about upcoming events.

More about education

Research

Find information about our award winning research, divided into our 12 research groups.

More about research

About DTU Environment

Welcome to Department of Environmental Engineering at DTU. Find information about employees, along with the aims & scope of the Department.

More about DTU Environment

Film Universe for Prospective MSc Students

Course of the year
Click to nominate

Specialists at DTU Environment
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Staff
Find employees at DTU Environment

Vacant positions at DTU Environment
Here you can look up vacant positions at DTU Environment.

International students

News

The Latest ISI Publication
The latest ISI publication authored/co-authored by an DTU Environment researcher

Environment award to associate professor Anders Baun
The Environmental Award 2008 has been given to associate professor Anders Baun, DTU Environment and NanoDTU by the Aase & Ejnar Danielsens Foundation. The award (250,000 DKK) is given in...