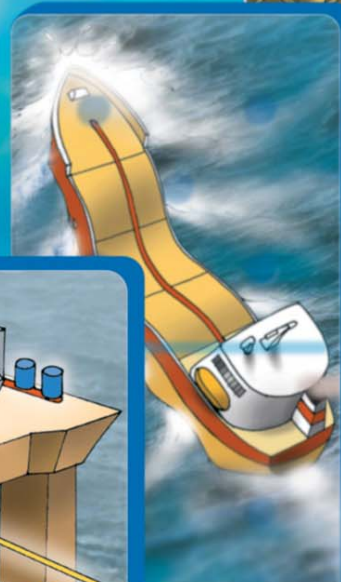
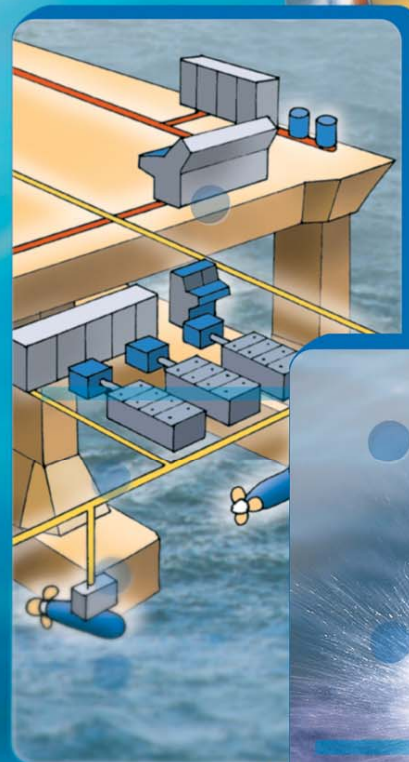


Master of Science In Marine Technology

Your opportunity to get a successful
career anywhere in the world

Information about MSc degree and
international MSc programmes



NTNU
Norwegian University of Science and Technology
Faculty of Engineering and Technology (IVT)
Department of Marine Technology (IMT)

Mastering Marine Technology

The MSc degree in Marine Technology gives you a challenging and exciting education for the future. Marine Technology is an ideal specialisation for firstdegree engineers with technical interests. This is an education that provides innovative, professional challenges and lead to a variety of career possibilities.

The challenge of the sea

The sea has always meant something special to mankind. It can be seductive and challenging, strange and mystical. At the same time, however, it is full of resources on which we depend; the sea can be cultivated and harvested, under the seabed are substantial energy resources, and it has always been important for transport. The ocean is vital for providing us with food, energy and a means of global transport.

Offshore technology

There is a trend that more of the new activities related to exploration and exploitation of the offshore oil and gas resources take place in deeper water than before or at marginal fields. Financially viable and safe exploitation of these resources will demand lightweight floating platforms and shiplike vessels. Other advanced marine operations in the ocean space from allyear service vessels or platforms are a prerequisite for laying pipelines or cables, for installing sub-sea equipment as well as inspection, maintenance and repair/replacements of underwater facilities. The combination of deep-water, harsh wave conditions and ocean currents makes the design and operation of floaters, risers and mooring systems particularly challenging.

The demand for efficiency and safety requires high precision in marine operations. Automatic control of thruster systems (dynamic positioning of vessels) is required to limit the motions of ships or platforms and thereby displacements and stresses in risers during drilling operations, or in pipelines during laying, and to ensure precise lifting, installation and intervention operations.



Automatic control is crucial for meeting the future requirements for high performance and for satisfying the need to operate under demanding environmental conditions. This requires a close integration with hydrodynamics and structural dynamics.

Marine technology is important in connection with safety at sea and environmental protection, which are high priority areas. In addition, the challenges relating to the design and the understanding of the behaviour of ships and ocean structures are vital for planning and execution of marine operations. Another important area of interest is maintenance and repair of existing platforms, as they age in very harsh environmental conditions.



Ship Technology: Among the main driving forces in future sea transport is a demand for shorter time to market, which means higher speeds at sea and in harbour operations.

The increase in size and speed and the emergence of new concepts have given rise to new technical challenges. Weight minimization of the hull is essential for achieving the goal of producing environmentally friendly, low-cost, high-speed transport, but leads to more flexible structures that will have more pronounced dynamic effects making the relevance of fatigue failure an important consideration.

These changes are difficult to make solely on the basis of experience. Thus, explicit safety requirements are necessary as well as design by direct analyses based on first principles of hydrodynamic loads and their structural effects and strength. Then there is also the potential benefit from automatic control. The possibility to base design on such principles was envisaged in the early 1990s, but the complexity of hydrodynamic load predictions and their effects have hampered the introduction of this approach.



Efficient and reliable operations at sea imply designing ships and equipment that are dedicated to various types of operations (cable laying, rescue, fishing, etc.). More accurate description of wave, current and wind-induced motions are then required.

Automatic control can be applied to reduce the effect of wave impacts and green water, especially in high performance vessels, by minimizing the relative motion between the ship bow and waves by active foil damping, and when there are changes of course or speed. A main concern is ventilation of foils, particularly in high sea states. A new issue in this context is the structural design implications of introducing automatic control systems for motion damping.

Logistics and transport are areas that are undergoing rapid development. There are increasing demands for more complex integrated logistics services by the international shipping industry. High-speed vessels are now becoming serious competitors to aircraft under certain conditions. Such vessels will continue to develop in size, speed, seafaring qualities, choice of material, machinery and design.

Fisheries and aquaculture

Both fisheries and aquaculture are growing industries. The fish stocks of the world are a renewable resource that could feed the world forever, but today there is a great deal of overfishing. In order to preserve life in the oceans, we have to develop technology that will enable us to harvest the riches of the sea with minimal damage to the environment.

Nautical Science

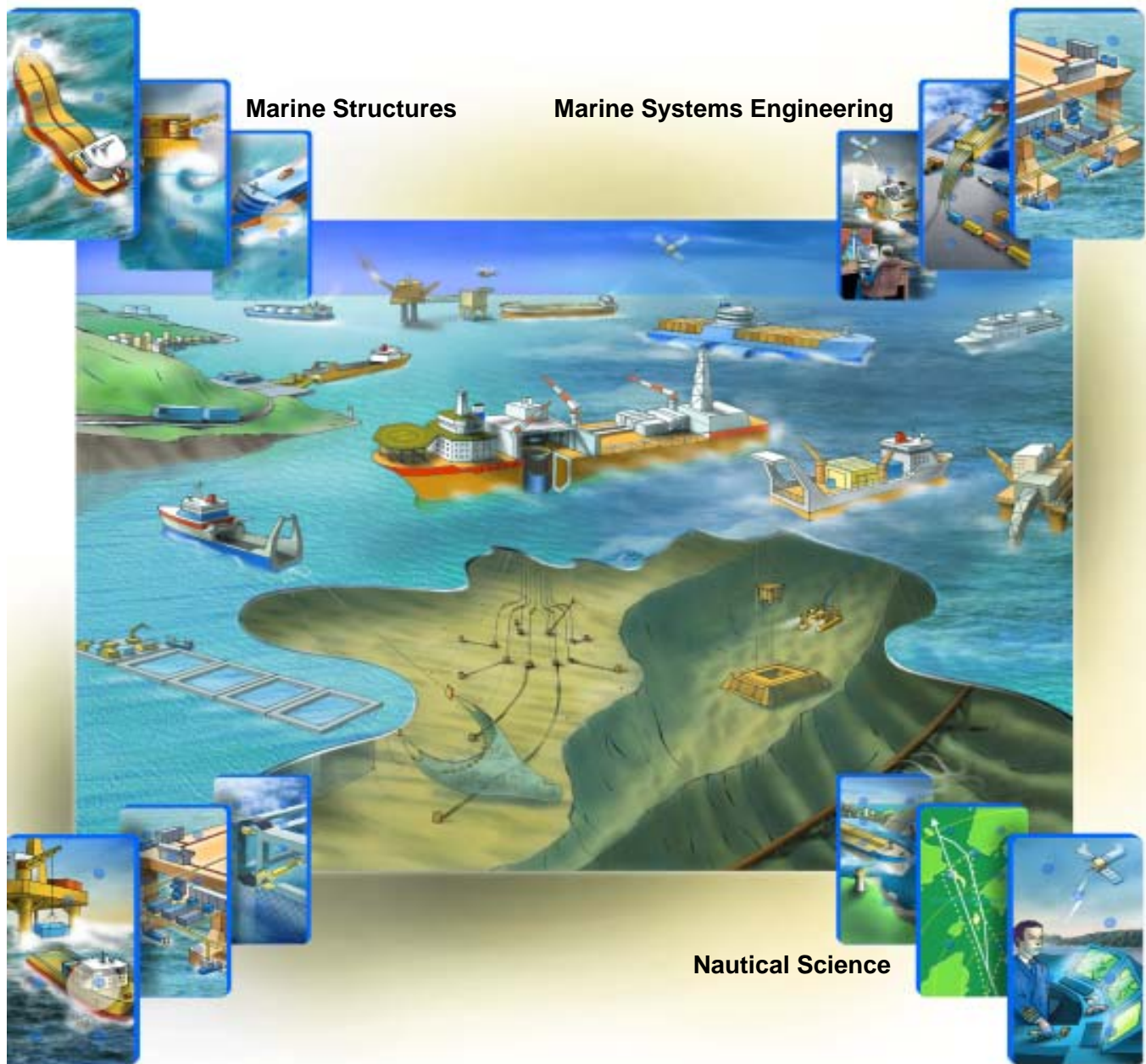
Increasing international focus on safe and efficient operations of ships and offshore units requires substantial competence and knowledge of nautical science. The introduction of advanced integrated navigation systems has changed onboard operational procedures and competence requirements for navigators.

High-speed vessels require other qualities from navigators than traditional vessels. Increased traffic density, tight schedules and more paperwork lead to increased workloads and fatigue for ship's officers. Greater use of information technology may be one way to resolve these problems.

Emphasis should therefore be given to the design of educational programmes which bridge the gap between man and technology and concentrate on formulating, analysing and solving nautical planning problems as well as testing and implementing real-life challenges in complex maritime operations.

The challenges and possibilities above will all demand new technologies that have to be understood and applied by well qualified university graduate engineers who have specialized in marine technology.

MSc Programmes in Marine Technology



The Department of Marine Technology, which is a part of Faculty of Engineering Science and Technology at NTNU, offers three international MSc Programmes:

- **Marine Structures**
- **Marine Systems Engineering**
- **Nautical Science**

ECTS credits in the MSc programmes

ECTS, The *European Credit Transfer System*, was developed by the European Commission in order to provide common procedures to guarantee academic recognition of studies abroad. This provides a way of measuring and transferring credits from one university to another. ECTS credits are a value allocated to courses that describe the student workload

required to complete them. They reflect the quantity of work each course requires in terms of total lecture time, practical work, seminars, individual study – in the library or at home – and examinations or other assessment activities. ECTS credits express a relative value.

In ECTS, 60 credits represent the workload for one year of study. In the description of the MSc programme below, ECTS credits are given for each subject and the thesis work. The whole programme represents two full years of study or 120 ECTS credits. Credits are awarded only when the courses are completed and all required examinations have been passed.

New students are admitted in August every year.

Courses, project

Only marine engineers can apply (see Admission requirements)

The subjects in semester 1–3 are advanced courses. Examinations in all the compulsory and optional subjects must be passed. Teaching and course material are given in English. In addition to the subjects, a project within one of the specified areas must be carried out in the 3. semester. The project work is an introduction and preparation for the thesis work.

Masters thesis

The thesis work is carried out in the 4. semester. The thesis must be written in English and obtain a passing grade.

Outline of the MSc programmes in Marine Technology

The programmes are offered every year. Application deadline for Scholarship-seeking students is 15. December the year before. www.ntnu.no/international/index.php

Semester	Marine Structures	Marine Systems Engineering	Nautical Science
Specialization	1) MARINE STRUCTURES 2) MARINE HYDRO-DYNAMICS	1) MARINE ENGINEERING 2) TECHNICAL OPERATION OF MARINE SYSTEMS 3) DESIGN OF MARINE SYSTEMS	
1.semester Aug-Dec (30 Cr/ECTS)	3 compulsory and one optional subject	3 compulsory and one optional subject	4 compulsory subjects
2.semester Jan-June (30 Cr/ECTS)	1-2 compulsory subjects Specialization in one of these areas: • Marine structures • Marine hydrodynamics	1-2 compulsory subjects + 1 optional subject Specialization in one of these areas: • Design of Marine Systems • Marine engineering • Technical operation of Marine Systems	2 compulsory subjects + 2 optional subject in one of these areas: • Control systems for marine operations • Marine operations • Oceanography • Naval hydrodynamics • Navigation systems
3.semester Aug-Dec (30 Cr/ECTS)	Project and Specialisation subjects	Project and Specialisation Subjects	Project and Specialization Subjects
4.semester Jan.-June (30 Cr/ECTS)	Master thesis	Master thesis	Master thesis

Marine Technology Centre - MARINTEK

The Department of Marine Technology works in close cooperation with MARINTEK, Norwegian Marine Technology Research Institute. Jointly they operate the Marine Technology Centre.

The Marine Technology Centre:

- is the workplace of about 250 specialists in marine technology (teachers, researchers and engineers) and app. 500 students.
- is an advanced resource where academic teaching and contract research in marine technology go hand in hand
- has numerous advanced laboratories and excellent computer facilities

Facilities

One of the main facilities is the Ocean Basin Laboratory, which is used for studying basic as well as applied ship and offshore problems. The Ocean Basin measures 50 x 80 metres with an adjustable bottom, enabling the water depth to be varied from 0 to 10 metres.

There are also other hydrodynamic laboratories, as well as structural testing and machinery laboratories at the Centre.

The centre offers excellent facilities for MSc-students. Each has his/her own desk, in rooms for seven people. There is also a cafeteria and a large marine technology library with its own reading room. As a MSc student of Marine Technology, you have the possibility to participate in this dynamic environment.

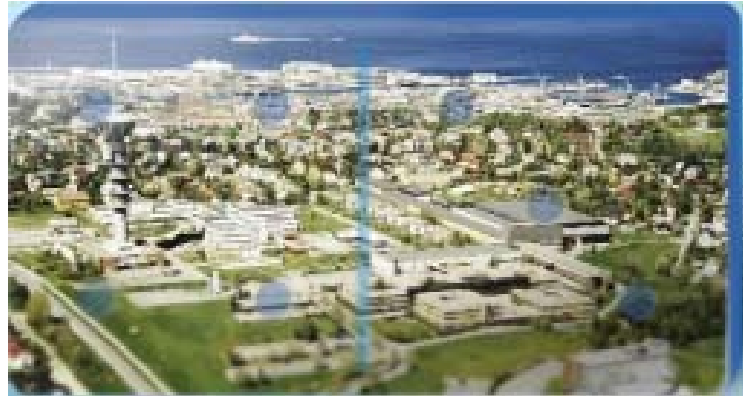
Practical Information

Trondheim, Norway

The city of Trondheim, founded in 997, holds a special place in Norwegian history and culture. Situated on the Trondheimsfjord, it is surrounded by forested hills, with the river Nidelva winding through its centre. West of the city is the outdoor eldorado, Bymarka.

The University is one of the city's largest employers and with altogether 30 000 students in Trondheim, the whole city reflects student life. Trondheim is not only Norway's leading city for students. It is also the home of the Rosenborg football team. The city has a theatre, concert hall and numerous other cultural facilities.

See further: www.trondheim.no



Internationally oriented

The shipping and the offshore industries are international. This also characterizes the Department of Marine Technology, which is:

- Harboring a Centre of Excellence: CeSOS Center for Ships and Ocean Structures, www.cesos.ntnu.no
- Cooperating with large international oil-companies.
- Joint organizer of large international conferences (BOSS, PRADS, FAST etc).
- Receiving PhD-level students, scholars and visiting professors from a number of Countries each year.
- Working closely with other leading Universities and has cooperative agreements with the Massachusetts Institute of Technology, the University of California at Berkeley, the University of Michigan and the University of New Orleans amongst others.
- Exchanging students with leading European universities as part of the European Commission's Socrates programme.

Far away is close at hand

Trondheim Airport Værnes has frequent connections to Oslo, and direct connections to Copenhagen and Amsterdam. There are also good roads, rail and sea connections to the rest of Norway.

Gulf Stream climate

The weather in this region benefits greatly from Trondheim being at the receiving end of the Gulf Stream. This warm ocean current results in a coastal climate that is similar to Scotland.

Snow usually falls from mid-December until mid-March. The long, light days of summer are unforgettable at this latitude about 500 km south of the Arctic Circle.

Admission requirements

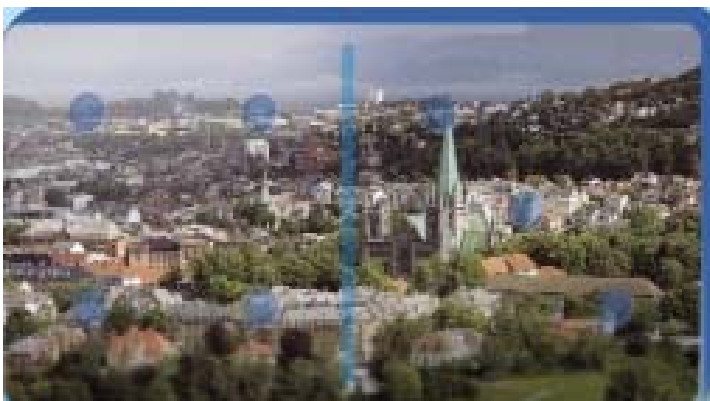
The normal requirements for entry to the MSc programmes will be a Bachelor of Science degree in Marine technology or a similar qualification (at least 3 years of university study) in areas related to marine technology, such as:

- Coastal or Harbour Engineering
- Ocean Engineering
- Offshore Engineering
- Marine Technology
- Naval Architecture
- Maritime Transport (Nautical Science Progr.)
- Nautical/Naval Science (Nautical Sci. Progr.)

For the Nautical Science Programme an additional entrance requirement is relevant sea experience (at least 12 months).

Applicants will be evaluated by an admission committee.

All lectures are given in English. A good working knowledge of English is therefore essential. Applicants whose native language is not English must demonstrate their capacity to complete a graduate programme in English. An English proficiency test (TOEFL with minimum score 500 in paper



test or 170 in computer-based test, or IELTS with score 5.0 or better) must be enclosed in order to fulfil the entrance requirements.

In addition to Norwegian students, up to 20 international students may be admitted to the MSc programme. International students with their own financial support are eligible to apply. Students from developing countries may be granted a loan or a scholarship from the Norwegian Government.

Studies in Marine Technology:

www.ntnu.no/imt

Office of international Relations (for info. and application)

www.ntnu.no/international

Application procedures

The Office of International Relations is responsible for admission. NTNU

(Norwegian University of Science and Technology) NO-7491 Trondheim, Norway

Phone: +47 73 59 57 00

e-mail address: International@adm.ntnu.no

URL: www.ntnu.no/international

For further academic information about the Programmes you may contact *Department of Marine Technology, NTNU, NO-7491 Trondheim*

Phone: +47 73 59 55 01

e-mail address: mscadm@ivt.ntnu.no or hanne.edvardsen@ntnu.no

URL: www.ivt.ntnu.no/imt

Application deadline:

For students with individual funding the preliminary application deadline is 1. December in the year before admission.

For Quota Programme-applicants the preliminary application deadline is 1. December in the year before of admission.

Then after screening, a final application deadline is 1. February 2008. After receiving the final application form it is to be returned with certified copies of all educational diplomas/transcripts and certificates, TOEFL/IELTS-scores, etc. Applications without complete transcripts will not be considered. Entrance to the programme is highly competitive and good grades from your previous university education are necessary.

Tuition fee

State universities in Norway have no tuition fee. You are however responsible for the payment of:

- a minor semester fee to the Student Welfare Organization
- study materials (textbooks, lecture notes etc.)
- the tours that are arranged during the programme, if you want to participate

Accommodation

If admitted to the MSc programme, a room will be provided for you at the Student Village at Moholt. It is about 10 minutes walk from the Marine Technology Centre.

Residence permit and visa

In order to study in Norway, international students must obtain a student residence permit. This permit must be obtained before leaving one's home Country. A Norwegian Embassy or Consulate will provide the necessary application form and information. More information will be given with the letter of admission.

NTNU

The Norwegian University of Science and Technology (NTNU) is the result of a merger of the former Norwegian Institute of Technology (NTH) and the College of Arts and Science (AVH)

The university has the following faculties:

- Faculty of Architecture and Fine Art
- Faculty of Engineering Science and Technology
- Faculty of Information Technology, Mathematics and Electrical Engineering
- Faculty of Arts
- Faculty of Natural Sciences and Technology
- Faculty of Medicine
- Faculty of Social Sciences and Technology Management
- Museum of Natural History and Archaeology

The Department of Marine Technology is one of 10 departments of Faculty of Engineering Science and Technology. This faculty has about 2700 students (integrated BSc/MSc level)

Key facts about Department of Marine Technology:

- 500 students (integrated BSc/MSc level)
- 50 PhD - students
- 20-30 international MSc students and exchange students
- 25 professors and 50 other staff

MARINTEK

MARINTEK (Norwegian Marine Technology Research Institute) delivers marine technology research and development services throughout the world. The clients include the leading domestic and foreign companies and authorities within marine technology. The most important marine related industries are:

- Offshore oil/gas industry
- Ship building industry
- Shipping

The institute is organized in two divisions:

- Marine Structure
- Marine Systems Engineering

MARINTEK is part of the SINTEF group and cooperates closely with the Norwegian University of Science and Technology (NTNU) – Department of Marine Technology.

Staff: Approximately 180

Annual budget: Approximately NOK 200 million



NTNU

Norwegian University of Science and Technology

Faculty of Engineering and Technology (IVT)

Department of Marine Technology (IMT)

www.marin.ntnu.no/msc