



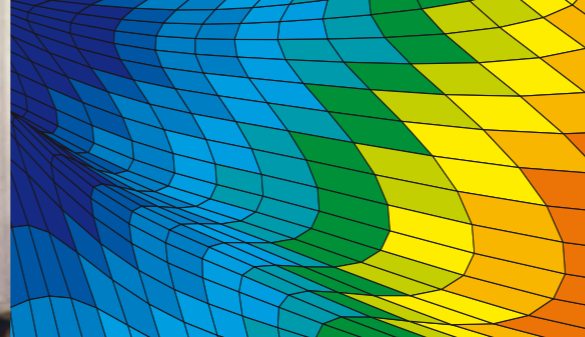
INTERNATIONAL MASTER PROGRAMS

CHEMICAL AND BIOPROCESS ENGINEERING
ENVIRONMENTAL ENGINEERING
ENVIRONMENTAL STUDIES: CITIES AND SUSTAINABILITY
GLOBAL INNOVATION MANAGEMENT
INFORMATION AND COMMUNICATION SYSTEMS
MECHANICAL ENGINEERING AND MANAGEMENT
MECHATRONICS
MICROELECTRONICS AND MICROSYSTEMS
SHIP AND OFFSHORE TECHNOLOGY
MBA/MASTER OF ARTS IN TECHNOLOGY MANAGEMENT

M.Sc./MBA – INFORMATION

TUHH

Hamburg University of Technology



DO YOU WANT TO BE ONE OF THE BEST EDUCATED ENGINEERS? – JOIN TUHH!

Germany has a strong reputation for producing world-class engineers. Hamburg University of Technology (TUHH) offers Master's degree courses in engineering taught in English. Education of the highest quality will lead you to a Master of Science degree within two years. The Master's degree courses at TUHH are open to students from all over the world. We are looking for highly motivated well qualified students with a first degree in engineering who wish to acquire an excellent graduate education in a challenging international academic environment. If you are future-oriented, open-minded and have a strong interest in innovative education and research, then TUHH is for you. Furthermore, in cooperation with our partner, the NIT Northern Institute of Technology Management, we can offer 35 highly ambitious and skilled students per year the Double Degree Program consisting of a "Master of Science" in an engineering program and an "MBA" or „Master of Arts“ in Technology Management.

WHY STUDY ENGINEERING SCIENCE IN GERMANY?

The profile of German engineering higher education focuses on research and application, including practical training in industry. It is characterized by a solid mathematical and scientific foundation as well as features such as humanism and the Humboldt Principle of the unity of research and teaching. The base of knowledge covers a wide range, and priority is given to the knowledge of methodology as opposed to mere repetition. This equips the engineer for quick adaptation to new fields of technology and new areas of employment. It should be noted that students at German universities are trained to think and decide for themselves, to learn and to work independently as well as in a team. This solid, comprehensive education develops the qualifications and personal skills necessary for outstanding professional or academic careers.

The Federal Republic of Germany is situated at the heart of Europe. More than 80 million people live in Germany, 6.75 million coming from foreign countries. Germany is one of the most highly industrialized and economically developed countries in the world. Its countryside is extremely varied and famous for its beauty. Its rich cultural heritage attracts visitors from all over the world.

A CHALLENGE FOR ENGINEERING SCIENCES

The ongoing globalization of markets requires an increasing internationalization of education. Hamburg University of Technology (TUHH) is prepared to accept this challenge by offering two-year Master Programs in engineering sciences, taught in English. The programs combine the strengths of German engineering education with an international orientation – an excellent preparation for a global working environment.

The mission we follow in our research, teaching and technology is the development of technology for the benefit of mankind. According to this motto, students of many different academic, national and cultural backgrounds study and work together in international teams at TUHH.

The teaching of methodology and the logic of engineering – "learning to think" – is a key aspect of education at TUHH. This is the way knowledge keeps pace with rapid technological change. This sound theoretical foundation is rounded off by a well-balanced mixture of practical application in projects and thesis work.

The Master Programs have an international character. Courses are offered in English and directed toward a diverse group of students from around the world. However, living and studying in Germany gives participants yet another exciting perspective – to become part of a vibrant city in the heart of Europe.

INTERNATIONAL MASTER PROGRAMS

Master Programs in engineering sciences at TUHH

- Chemical and Bioprocess Engineering
- Environmental Engineering
- Mechanical Engineering and Management
- Information and Communication Systems
- Mechatronics
- Microelectronics and Microsystems

Joint European Master Programs

- Environmental Studies: Cities and Sustainability
- Global Innovation Management
- Ship and Offshore Technology

Double Degree Program in Cooperation with NIT

- Engineering Science + Technology Management (MBA or M.A.)

A corresponding Bachelor's Program (General Engineering Science) is also offered at TUHH.

COURSE STRUCTURE

A Master's degree course lasts two years, with classes starting in mid-October. In the first year students take part in lectures, discussion sections, tutorials and laboratory work. A project work and a special seminar or a process design course follow in the third semester. The program is completed with a six-month Master thesis in the fourth semester. After the successful completion of the course, the Master of Science degree will be awarded.

Programs funded and supported by



DAAD

Deutscher Akademischer Austausch Dienst
German Academic Exchange Service



HRK German Rectors' Conference
The Voice of the Universities

Accredited by





STUDYING AT TUHH

ABOUT TUHH

Young and ingenious – these are just two words to describe Hamburg University of Technology. TUHH was founded in 1978. Since then, a beautiful campus has been developed, and TUHH has turned into a popular and successful training center for the new generation of engineers. About one in five of our students is of a foreign nationality; we are one of the top destinations for foreign students in Germany and consider ourselves to be a truly international campus.

CENTER FOR TEACHING AND LEARNING

TUHH promotes interdisciplinary research, teaching and learning. Teaching excellence is one of the most important goals at TUHH. To meet this goal, the TUHH has created the Center for Teaching and Learning which brings together experts in teaching and didactics to advance innovation in the classroom. TUHH educators work with students and faculty to develop methods that activate students in the learning process, and help them to develop in-depth understanding that takes them well beyond their next exam.

Additionally, students are integrated into research and development projects at an early stage, thus providing a smooth transition to working life. Research, led by a professorship in didactics, focuses on identifying and addressing the conceptual hurdles faced by engineering students.

Insights from this active research pro-

gram stimulates and evaluates teaching innovations implemented by the center's educators, thereby helping TUHH give life to its goal of teaching excellence.

HAMBURG – A CITY TO LIVE IN AND LOVE

With a population of 1.8 million, Hamburg is Germany's second-largest city. No other city can offer its residents such proximity to water and green spaces in combination with the benefits of living in the middle of a pulsating metropolis. Hamburg is a city of culture which offers a large variety of theaters, music events and much more. Furthermore, it is one of the most dynamic commercial centers in Europe.

As a global hub for overseas, central and eastern Europe and the entire Baltic Sea region Hamburg benefits from its central position at the heart of Europe's logistical commodity flows. It is one of the most significant centers for civil aviation industry worldwide and offers proficiency covering all areas of aviation. In Hamburg, environmental awareness has a long history – and a future. Today, the Hanseatic city is known as one of the leading centers of research on climate change, the global challenge of our time. Several leading companies make Hamburg a center of renewable energy technologies like wind-power systems.

In Hamburg 70,000 students are enrolled at 18 universities and colleges. Hamburg universities are networked in many ways with Hamburg-based research facilities such as the German Electron Synchrotron (DESY), the Bernhard Nocht Institute of

Tropical Medicine or the Max Planck Institute of Meteorology. TUHH cooperates in technology and research institutions and in technology transfer with key players in industry.

ENTREPRENEURSHIP AT THE TUHH – FROM A STUDENT TO AN ENTREPRENEUR

Hamburg University of Technology is an entrepreneurial university which has created a number of technological and innovative startup companies over the past decades. All activities aiming at building an entrepreneurial culture on the campus are provided by a Center for Innovation and Entrepreneurship called "TUHH Startup Dock".

The goal of the TUHH Startup Dock is to support students in developing their ideas into new businesses by providing expert coaching, high-quality training and network of business contacts. Additionally, the TUHH students are invited to participate in regular Startup Talks with successful entrepreneurs, startup events and business competition organized by the Startup Dock.

The TUHH facilitates developing important capabilities such as creative thinking, innovative problem solving, leadership, communication and presentation skills, which are valuable not only for future entrepreneurs but also for successful professionals in various industries.

Further information:
www.startupdock.de

TUHH is active in the different areas of both basic and application-related

RESEARCH AT TUHH

research and collaborates closely with companies and other research institutions in the Hamburg metropolitan region. Cases in point are its cooperation in aviation research at the Finkenwerder Technology Center with Airbus Deutschland GmbH or

- Helmholtz-Zentrum Geesthacht Centre for Materials and Coastal Research
- German Aerospace Research Centre (DLR)
- DESY Research Centre in Hamburg
- UKE, University Medical Center Hamburg-Eppendorf

FIELDS OF COMPETENCE

In developing its strategy, the TUHH has further enhanced its research structure. It bundled research competencies of its research centres and institutes in a Center of Research and Innovation. Research activities have been focussed and brought together in three competence fields:

- **Green Technologies**, covering the research fields Renewable Energy, Systems – Storage – Networks, and Water and Environmental Technology,
- **Life Science Technologies**, covering the research fields Medical Technology, Biomaterials, and Chemical and Bioprocess Technology, and
- **Aviation and Maritime Systems**, covering the research fields Aeronautics, Logistics and Mobility, and Maritime Systems and Structures

RESEARCH CENTERS

Research at TUHH is organized in the form of research centers (RCs). Each is

headed by two professors and involves the detailed contributions of 10 to 15 institutes.

The RCs are focusing on interdisciplinary subjects thereby making optimal use of the strengths and talents:

- Integrated Biotechnology and Process Engineering
- Climate Protecting Energy- and Environmental Engineering
- Regeneration, Implants, Medical Technology
- On- and Offshore Civil Engineering Structures
- Maritime Systems
- Self-Organizing Wireless Sensor and Data Networks
- Aeronautics
- Product-Oriented Materials Development
- Logistics and Mobility

www.tuhh.de/index.php?id=14492&L=1

INSTITUTES

Institutes execute the key functions of TUHH: research and education.

www.tuhh.de/index.php?id=14506&L=1

GRADUATE ACADEMY FOR TECHNOLOGY AND INNOVATION

As a central organizational unit the Graduate Academy offers trainings on transferable skills and career development as well as various networking opportunities that are open to all junior scientists of TUHH.

DFG RESEARCH TRAINING GROUP

- Integrated Tailor-Made Multi-Scale Materials
- Systems – M3

DFG PRIORITY PROGRAMS

- Dynamic Simulation of Interconnected Solids Processes
- Porous media with defined porous structure in Chemical Engineering – modelling, applications, synthesis
- The Influence of Local Transport Processes on Chemical Reactions in
- Bubble Flows
- DFG Research Units (participation)
- Nanoporous gold - A prototype for a rational design of catalysts
- Memristive devices for neuronal systems

DFG Collaborative Research Centres (SFB)

- Tailor-Made Multi-Scale Materials Systems – M³

FACTS AND FIGURES TUHH 2015

Annual Budget: EUR 122 million including
External Funding: EUR 39 million
Professors: 97
Research Assistants: 675
Students: 6,700
International students: 17%
Female students: 26%
Graduates: 1,221
Doctoral Degrees: 100



INTERNATIONAL MASTER PROGRAMS

ERASMUS MUNDUS PROGRAM

In cooperation with other top European universities TUHH offers one joint Master's degree course that has been selected by the European Union as ERASMUS MUNDUS program because of its outstanding academic quality. This joint program offer student and staff mobility between partner universities, with industrial projects giving students the leading edge in the employment market. ERASMUS MUNDUS programs generally include a scholarship scheme with generous grants for applicants of exceptional merit.

- Joint European Master in Environmental Studies: Cities and Sustainability in cooperation with Universidade de Aveiro (PT), Universitat Autònoma de Barcelona (ES), Aalborg Universitet (DK)

Further information: www.jemes-cisu.eu

JOINT EUROPEAN MASTER PROGRAMS

- European Master in Ship and Offshore Technology (SOT) in cooperation with University of Strathclyde (Glasgow, UK)

Further information:
www.strath.ac.uk/na-me/studyhere/post-graduatestudies/shipoffshoretechnology/

- European Master in Global Innovation Management (GIM) in cooperation with Aalborg Universitet (DK), University of Strathclyde (Glasgow, GB), Swinburne University of Technology (Melbourne, AU)

Further information:
www.globalinnovationmanagement.org

TUHH & NIT – DOUBLE DEGREE MSc + MBA PROGRAM

A „made in Germany“ higher education in engineering provides a perfect basis to meet the challenges companies face today. Add general management know-how, professional leadership skills, expertise in entrepreneurial management as well as proficiency in an additional foreign language (other than English) – and you are a technology manager with exciting international job perspectives knowing how to deal with industry 4.0 and big data also from the management side. An M.Sc. in Engineering plus an MBA or Master of Arts in Technology Management in about two and a half years – this is the unique combination TUHH and NIT offer every year to 35 ambitious students from all over the world. They live, learn and work together in the NIT building on TUHH campus. NIT graduates set out to make a positive impact on the world.

MBA FOR YOUNG PROFESSIONALS IN ENGINEERING AT NIT

Designed as a part-time study program with lectures, seminars and workshops mostly in the evening, weekends and during two four-week Spring Schools, the MBA course is also an attractive offer to young professionals interested in Technology Management for their future career development.

Further information: www.nithh.de

POSTGRADUATE OPPORTUNITIES

Since its foundation as a research university TUHH has always had close contacts to leading German and European high-technology companies. There are many joint research projects, allowing qualified students to do their project or thesis in one of these industrial partner institutions. This cooperation, in combination with the excellent reputation of education at TUHH with many employers, opens opportunities for employment in Germany after graduation. Furthermore, German law allows international students to accept employment after successfully completing a degree course at a German university.

An M.Sc. degree obtained at TUHH is equivalent to the traditional German Dipl.-Ing. degree and allows graduates to continue their studies to a Ph.D. Many Master graduates of TUHH have obtained Ph.D. positions within TUHH or at leading universities or laboratories throughout Germany and the world. Since TUHH offers many interesting projects and positions for students wishing to pursue doctoral studies, a considerable number of students decide to stay at TUHH for the Ph.D.

TU & YOU

TU & YOU is a world-wide network of alumni, students, academic and administrative staff of the TUHH, friends and sponsors, enabling members to keep in touch with their university and with each other and benefit from many advantages in cash and kind. The aim is to set up a university community, a TU & YOU

family, that lives the culture of reciprocal assistance and support. A regular newsletter will keep you informed about developments at the university, worldwide alumni events and our members. Join a national and international alumni network - and Stay Tuned.

Further information: www.TUandYOU.de

ADMISSION REQUIREMENTS

Admission to TUHH is highly competitive. Selection for the international Master's degree courses at TUHH will be made by a selection committee on the basis of the documents of application. The international Master's degree courses at TUHH only start in winter semester (October 1), lectures at TUHH usually start in mid-October. There is no spring or summer semester intake. Applicants should hold a Bachelor's or equivalent degree in engineering in a relevant subject. They must show solid previous academic performance as well as proficiency in English by obtaining a minimum score of 90 (internet-based)/ 213 (computer-based)/ 577 (paper-based) on the TOEFL or a minimum score of 6.5 on the IELTS. For further details regarding admission requirements and the application procedure, please refer to the "application guidelines". The latest version of the application form is available at <http://www.tuhh.de/t3resources/tuhh/download/studium/studieninteressierte/How-to-apply-at-TUHH-general.pdf>

The following pages give an outline of the contents of the various Master's degree courses. Please note that the syllabi

are subject to change. Further information about the programs is available at www.tuhh.de/index.php?id=14120&L=1

STUDENT SERVICES

ROOMS FOR INTERNATIONAL FRESHMEN

The aim of the program "Rooms for international Freshmen" is to offer support in finding accommodation in and around Harburg to prospective international TUHH degree and exchange students. In cooperation with the Studierendenwerk Hamburg the Accommodation Office can arrange a limited number of rooms in the three Harburg halls of residence.

The Accommodation Office will also try to support international TUHH students in finding private rooms..

Further information:
<http://www.tuhh.de/alt/tuhh/international/students/study-with-us/accommodation-office-acco-tuhh.html>

COMPASS – LIVE-IN STUDENT ORIENTATION

Special student residency tutors from the program: "Compass – Live-in Student Orientation" are available for consultation. They inform about the day-to-day living in student halls of residence in Hamburg and will be available with interesting activities in the student halls and to support you if you need help.

Further information:
www.tuhh.de/index.php?id=14389&L=1

WELCOME@TUHH

The Integration Program for international students has the goal of promoting intercultural exchange on campus. The activities offered within our semester program such as discussions and workshops, international evenings and excursions will give you a chance to get in touch with fellow TUHH students, get to know the German culture and gain fluency in German and English. By offering various study related activities the Welcome Program aims to give international students more orientation. Details of information about the Welcome@TUHH Program and registration are available at www.tuhh.de/welcome

CAREER CENTER

The Career Service and Business Service perform a key role as intermediaries at the interface between educational and employment systems. Professional preparation for embarking on a career and the first career steps is the central task of the Career Service and the Business Service. Services provided range from providing information material and individual career planning advice to job application training and seminars on professional skills such as presentation methods, rhetoric or leadership skills, taking gender-specific aspects into consideration. Tasks performed by the Business Service include, along with maintaining close contacts with national and international companies, a special focus on the implementation of TUHH-PraxisPlus, a high-caliber internship program with selected industry partners.

Further information:
www.tuhh.de/careercenter



INTERNATIONAL MASTER PROGRAMS



CHEMICAL AND BIOPROCESS ENGINEERING

This multidisciplinary program offers an opportunity to gain a broad knowledge in both biotechnological processes and classical chemical engineering. Close collaboration of these disciplines is a special feature of TUHH in both education and research. Beside a basic knowledge of biological and biocatalytic processes, separation technologies, mechanical and reaction engineering, master students gain insight into the most challenging problems on the boundaries of these disciplines and participate in the collaborative research of several departments.

SYLLABUS

The students have to take a fixed number of compulsory courses from two main blocks, biotechnology and process engineering, to gain basic knowledge in both areas. Subsequently elective courses can be selected individually to get specialized in a desired field. The courses cover a wide range from particle technology to tissue engineering. Additionally non-technical courses (languages, management) are offered.

Compulsory

- Biocatalysis
- Applied Microbiology
- Separation Technologies for Life Science
- Numerical Methods
- Applied Thermodynamics
- Bioreactor and Bioprocess: Theory and Experimental Course
- Heterogeneous Catalysis: Theory and Experimental Course

- Process Systems Engineering
- Biosystems Analysis and Engineering
- Transport Processes
- Particle Technology (IMP)

Experimental Courses

- Particle Technology
- Chemical Engineering
- Bioprocess Engineering

Elective Technical Courses

- Cell and Tissue Engineering
- High Pressure Chemical Engineering
- Renewables
- Molecular Modelling and Heterogeneous Equilibria
- Implants and Regenerative Medicine
- Aquatic Chemistry and Environmental Analysis
- Computational Fluid Dynamics in Process Engineering
- Selected Applications of Solids Process Engineering
- Applied Statistics for Engineers
- Interphases and Food Technology
- Environmental Biotechnology
- Cleaning-In-Place (CIP)
- Technical and Environmental Microbiology
- Brewing Technology

Course Coordinator

Prof. Dr. Raimund Horn
horn@tuhh.de

Further information:

www.tuhh.de/index.php?id=14156&L=1

Questions to application process
study@tuhh.de

ENVIRONMENTAL ENGINEERING

This Master program is devoted to all relevant skills on the quality of the environment and to the technologies for its conservation. It involves the basic theoretical and practical training from civil engineering programs and chemical engineering, microbiology, hydrology, and chemistry. It aims to broaden students' perspective on potential solutions to environmental problems.

SYLLABUS

In the first semester students have to take a workload of 30 ECTS of compulsory modules (core qualification). Based on individual preference (Water / Waste & Energy / Biotechnology) students have to take additional 18 ECTS of subjects from a set of 60 ECTS core qualification modules in their second semester. In addition, students choose in the second and third semester their specification by a set of 18 ECTS and the project work (12 ECTS).

Core qualification

- Environmental Protection and Management
- Environmental Analysis
- Waste Treatment Technology
- Fluid Mechanics and Hydraulics
- Wastewater Systems and Reuse
- Practical Course in Water and Wastewater
- Elective (18 ECTS)
- Hydrological Systems
- Geochemical Engineering
- Management of Surface Water
- Technical Microbiology
- Water and Wastewater Systems
- Hydrobiology

- Sludge Treatment
- Environmental Aquatic Chemistry
- Energy from Biomass
- Nontechnical Elective Courses
- Business and Management

Specification (select one, 18 + 12 ECTS) Water

- Membrane Technology
 - Groundwater Modeling
 - Analytical Methods and Treatment Technologies for Wastewaters
 - Process Modeling in Water Technology
 - Resources Oriented Sanitation Systems
 - Project Work
- #### Waste and Energy
- Waste and Energy
 - Air Pollution Abatement
 - Advanced Topics in Waste Resource Management
 - International Waste Management
 - Project Work

Environmental Biotechnology

- Bioprocess and Biosystems Engineering
- Biocatalysis
- Bioresources and Biorefineries
- Industrial Biotransformations
- Environmental Biotechnology
- Project Work

Master Thesis (30 ECTS)

Course Coordinator

Prof. Dr.-Ing. Mathias Ernst
mathias.ernst@tuhh.de

Further information:
www.tuhh.de/IMPEE



INTERNATIONAL MASTER PROGRAMS

INFORMATION AND COMMUNICATION SYSTEMS

One of the industries with the largest growth rates is the communications industry. Over the years its products have achieved a synergy of the classical disciplines of computer science and networking. The Master program in Information and Communication Systems addresses this rapidly evolving area by laying in-depth foundations for the design and implementation of networking infrastructures as well as for the applications running on them.

- Communication Networks II
- Queuing Theory for Communication Networks
- Introduction to Antenna Theory
- Mobile Communications
- Network Security

Course Coordinator
Prof. Dr.-Ing. Andreas Timm-Giel
 timm-giel@tuhh.de

Further information:
www.tuhh.de/index.php?id=14127&L=1

SYLLABUS

The program comprises a set of compulsory elective courses which address three more specific areas of the subject.

Software for Information and Communication Systems

- Computational Web
- Verified Software Systems
- Software for Embedded Systems
- Software Analysis
- Foundations of Machine Learning and Data Mining
- Project Laboratory
- Software Security

Digital Signal Processing

- Adaptive Compute Systems
- Digital Video Signal Coding
- Digital Audio Signal Processing
- Digital Filters
- Digital Signal Processors
- Digital Image Processing

Networking

- Optical Communications
- Microwave Engineering
- Communication Networks I

MICROELECTRONICS AND MICROSYSTEMS

Microelectronics has not only triggered the enormous growth in information and communication technologies but has also become an important factor in many other areas. In recent years technologies originally developed for microelectronics have been increasingly applied to miniaturized systems in electromechanical, electro-optical, analytical or biomedical applications. The new discipline is called microsystems technology. The future development will certainly result in the integration of microsystems components with microelectronic devices. In order to be able to cope with this challenge, TUHH has introduced the innovative Master program in Microelectronics and Microsystems which combines both aspects.

SYLLABUS

The program comprises a set of compulsory and elective courses which address four more specific areas of the subject:

Microelectronics

- Electronic Devices
- CMOS Nanoelectronics
- Circuit Design
- Laboratory: Circuit Design
- Fundamentals of IC Design
- CAD-Tools
- Design of Highly Complex Integrated Systems
- Optoelectronics I
- Optoelectronics II

- Electronic Circuits for Medical Applications
- Microsystems (Compulsory)**
- Microsystem Engineering
 - Microsystems Design
 - Microsystems Technologies
 - Laboratory: Microsystem Design

Communication

- Fibre and Integrated Optics
- Advanced concepts of wireless communications
- Microwave Engineering
- Communication Networks I

Computer Science and Signal Processing

- Computational Web
- 3D Computer Vision
- Digital Signal Processing and Digital Filters
- Digital Image Analysis
- Digital Audio Signal Processing

Course Coordinator
Prof. Dr.-Ing. Wolfgang Krautschneider
 krautschneider@tuhh.de

Further information:
www.tuhh.de/index.php?id=14151&L=1

MECHANICAL ENGINEERING AND MANAGEMENT

Nowadays engineers work not only as designers or as problem solvers in technical issues, but also fill management positions and have to make strategic and operative decisions. In addition to profound and specialized knowledge in diverse engineering fields, engineers also need a basic understanding in management and business studies. Graduates, who already bring along both, specialized knowledge in engineering as well as basic understanding of business administration, have excellent prospects in the labor market. The international master study course "Mechanical Engineering and Management" gives students with a bachelor's degree in mechanical engineering or similar the opportunity to deepen their engineering knowledge in one of three technical specifications, Materials, Mechatronics, or Product Development and Production, and provides basic knowledge in management and business administration. Graduates are well prepared for a future career in industry as technical and executive managers with budget and personnel responsibilities.

SYLLABUS

The compulsory courses aim at the core competences in all four specifications while the choice of the technical specification as well as the elective courses within the specifications help creating an individual profile. Students studying in the double degree program in cooperation with Northern Institute of Technology choose instead of the Management specification a second technical specification.

Management specification

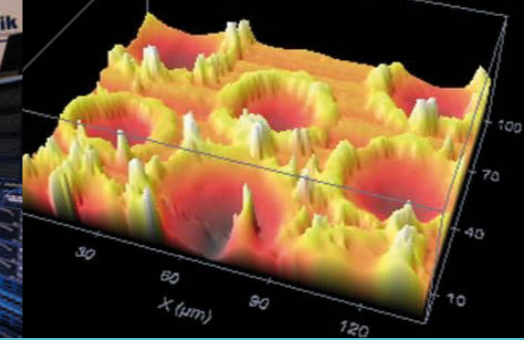
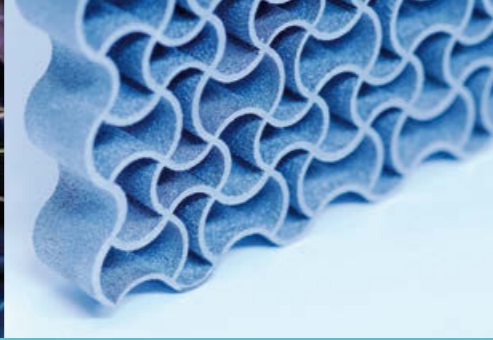
- basic knowledge in business administration and management
- Special topics: e.g. product and technology management, human resources, corporate management

Engineering specifications (choose one)

- Materials*
- material properties, behavior and calculation of material properties
 - Special topics: e.g. design with and manufacturing of composites and plastics
- Mechatronics*
- robotic, system engineering, control engineering
 - Special topics: e.g. computer vision, nanoelectronics, signal processing
- Product Development and Production*
- finite element methods, design, modern manufacturing techniques
 - Special topics: e.g. rapid production, high order FEM

Course Coordinator
Prof. Dr.-Ing. Dieter Krause
 krause@tuhh.de

Further information:
www.tuhh.de/alt/tuhh/education/degree-courses/international-study-programs/mechanical-engineering-and-management.html



JOINT EUROPEAN MASTER PROGRAMS

MECHATRONICS

Connecting the disciplines of mechanics, electronics, computer science and control engineering is the core competence of modern engineering. Thus the Mechatronics curriculum provides a broad insight into state-of-the-art methods for this interdisciplinary combination reinforced by research projects carried out at the university or in industry. Further specialization in one of the disciplines „System design“ and „Intelligent Systems and Robotics“ is realized through the technical electives. Individual emphases are possible due to a wide range of courses in each discipline. A future career is possible in a wide array of industries including aviation engineering, automotive industry, ship building, biomedical devices engineering and electronic entertainment.

- Robotics and Navigation in Medicine
- 3D Computer Vision
- Advanced Topics in Control
- Intelligent Systems in Medicine
- Industrial Process Automation
- Seminar on Humanoid Robotics,
- Digital Signal Processing and Digital Filters

System Design

- Boundary Element Methods
- Technical Acoustics
- CMOS Nanoelectronics
- Microsystem Engineering
- Nonlinear Structural Analysis
- Analog and Digital Circuit Design
- Linear and Nonlinear System Identification
- Microsystem Technology
- Reliability in Engineering Dynamics

Course Coordinator

Prof. Dr.-Ing. Uwe Weltin
weltin@tuhh.de

Further information:

www.tuhh.de/index.php?id=14122&L=1

SYLLABUS

The compulsory courses aim at combining the four disciplines that make up Mechatronics, the elective courses enable each student to focus and enhance their individual profile.

Compulsory Courses

- Control Systems Theory and Design
- Design and Implementation of Software Systems
- Robotics
- Finite Element Methods
- Mechatronic Systems
- Vibration Theory

Selected Technical Elective Courses

Intelligent Systems and Robotics

- Nonlinear Dynamics
- Optimal and Robust Control

INTERDISCIPLINARY COURSES

Technological challenges of modern society and requirements of the globalized labor market call for an excellent engineering education as well as for a sound additional qualification in the fields of business and management, soft skills and humanities. Therefore all Master's degree courses at TUHH include a number of at least six non-technical elective courses from a university-wide catalog e.g.

Business and Management

- Public and Constitutional Law
- Project Management
- Entrepreneurial Management
- Marketing
- Innovation Debates
- Entrepreneurship in Green Technologies

Complementary Courses

- European Culture
- Humanities and Engineering
- Foreign Language Course
- German as a Foreign Language
- Leadership and Communication in Teams

Apart from these courses, which are integrated into the program, students are invited to take additional language courses or to attend compact seminars, e.g. on intercultural awareness, rhetoric, presentation techniques or career training.





JOINT EUROPEAN MASTER PROGRAMS

ENVIRONMENTAL STUDIES: CITIES AND SUSTAINABILITY

The Joint European Master in Environmental Studies: Cities and Sustainability (JEMES CiSu) follows a worldwide trend towards rapidly growing metropolises which requires an increased focus on environmental and climate issues in cities and towns. The program aims to enable excellent graduates with first degrees in engineering, science, management and technology to successfully deal with complex urban processes and problems across international, cultural and disciplinary boundaries. The JEMES CiSu program is divided into two sub-themes, namely:

- Sustainable **Management & Planning** (with Aalborg Universitet (AAU) and Universitat Autònoma de Barcelona (UAB))
- Sustainable **Technologies & Processes** (with TUHH, and Universidade de Aveiro (UA))

The JEMES CiSu program is structured so that students undertake their studies with at least two European universities and they have the option of including a third country university within the program's delivery in order to ensure increased multi-disciplinarity and a broader global scope. Therefore, the consortium of the four European universities has linked up with universities in Australia, China and the United States. Students have the option of either starting their studies at Aalborg Universitet or Universitat Autònoma de Barcelona and may end their studies at any of the four participating universities. Students must, however, spend their second semester at either Hamburg University of Technology or Universidade de Aveiro.

SYLLABUS

- **1st Semester** at Aalborg Universitet or Universitat Autònoma de Barcelona, 30 ECTS: **Cities & Sustainability in a Management Perspective:** The main teaching topics include life-cycle based management, tools and systems of sustainable development, ecological economics and political ecology.
- **2nd Semester** at Hamburg University of Technology or Universidade de Aveiro. 30 ECTS: **Cities & Sustainability in an Engineering Perspective:** The main teaching topics include air pollution, risk assessment and management, waste and energy systems and water and wastewater.
- **3rd Semester**, Mobility semester in third country/European University in the JEMES CiSu consortium, 30 ECTS: **Professional Development:** The third semester has a strong focus on project work and gaining practical experience and professional development vis-à-vis a combination of internship and project work. The project works is co-supervised and executed in strong collaboration with associated partners.
- **4th Semester** at the same European University where the 3rd semester was concluded, 30 ECTS: **Master's thesis, Joint European Master in Environmental Studies - Cities & Sustainability:** The Master's thesis is co-supervised by at least two partner universities and conducted in strong collaboration with associated partners.

TUHH Course Coordinator

Prof. Dr.-Ing. Stephan Köster
stephan.koester@tuhh.de

Further information: www.jemes-cisu.eu

SHIP AND OFFSHORE TECHNOLOGY (SOT)

Ship and Offshore Technology is a challenging subject not only with respect to highly specialized ships and installations for oil and gas exploitation, but also with regard to ocean renewable energy including wind farms. The course is jointly offered by TUHH and University of Strathclyde in Glasgow, both specialized in these fields. The program is designed for graduates in marine or marine-related engineering subject who wish to deepen their knowledge in the interdisciplinary fields of ship and offshore technologies.

The first year is spent at the University of Strathclyde with a special focus on offshore technology. Between the first and second year, a research project is carried out (either in Glasgow or Hamburg) and an intensive German language course is arranged. The second year at TUHH focuses on ship technology and the Master Thesis. The course language is English.

SYLLABUS

The compulsory courses aim at key areas which are essential to acquire core competences in the fields of ship and offshore technology. Some technical and non-technical elective courses enable each student to enhance his individual profile.

First year at University of Strathclyde

- Offshore Engineering Practice
- Risers and Mooring Lines
- Marine Pipelines
- Dynamics of Floating Offshore Installations
- Marine Safety and Risk
- Design and Construction of FPSOs

- Theory and Practice of Marine CFD
- Inspection and Survey
- Group Project
- Research Project

Second year at TUHH

- Structural Analysis of Ships and Offshore Structures
- Sea-keeping of Ships
- Ship Design
- Manoeuvrability
- Fatigue Strength of Ships and Offshore Structures
- Ship Vibration

Electives

- Arctic Technology
- Innovative CFD Approaches
- Manoeuvrability and Shallow Water Ship Hydrodynamics
- Nonlinear Structural Analysis
- Seakeeping of Ships and Laboratory on Naval Architecture

Course Coordinator

Prof. Dr. Sören Ehlers
ehlers@tuhh.de

Further information:

www.strath.ac.uk/na-me/studyhere/postgraduatestudies/shipoffshoretechnology

GLOBAL INNOVATION MANAGEMENT (GIM)

GIM equips students with skills to transform research output into innovative products and services. Learning the tools and techniques for working globally, students apply this knowledge practically by working on projects with industry contacts in different countries, further enhancing their understanding of international business. GIM addresses new challenges in innovative global enterprises and provides:

- A practical and global perspective of Innovation Management, through industry based modules
- Skills applicable for larger multinational organizations to smaller enterprises
- Expanded perspectives of Innovation Management including Technology Management, R&D and Product/Service Development with focus on the interface between disciplines involved in the process
- Increased research capability focused on activities at the periphery of the innovation process.

GIM provides a broad and global perspective of Innovation Management, placing particular emphasis on high technology and skill sets applicable to large, small and medium enterprises. Students do their first year in Glasgow and their second in Hamburg, Aalborg or Melbourne and will gain essential practical experience in working within globally distributed teams and industrial clients on product/service development briefs.

GIM is an ERASMUS MUNDUS program created by three leading European Universities: TUHH (Germany), Aalborg Universitet (Denmark), University of Strathclyde (Glasgow, Scotland) in cooperation with Swinburne University of Technology (Melbourne/Australia) to meet the current demands of students, industry and economy.

SYLLABUS

The program offers a strong foundation in the Innovation Management process, with essential practical experience of working in projects and within globally distributed teams.

Selected lectures, projects and seminars

- Product Planning
- Marketing
- Technology Management
- Global Innovation Management
- Business Planning
- Design for Manufacture and Assembly *
- Manufacturing and Business Strategy *
- Product Development Projects *
- Supply Chain Operations *
- People, Organizations & Technology *
- Management of Total Quality and Continuous Improvement *
- Product Branding and Promotion *

Course Coordinator

Prof. Dr. oec. publ. Cornelius Herstatt
c.herstatt@tuhh.de

Further information:

www.globalinnovationmanagement.org

* offered by the partner universities



DOUBLE DEGREE PROGRAM

The NIT Northern Institute of Technology Management and Hamburg University of Technology (TUHH) offer a double degree program for outstanding students with an ambition to achieve leadership positions in international, technology-oriented companies or to run their own enterprise in the future.

In addition to a TUHH Master program in engineering (please see page 8–12), students participate in the NIT Master or MBA program in Technology Management. It is designed for ambitious young engineers who strive to become responsible technology managers in a globalized world. During the two-year part-time program, students acquire a broad spectrum of knowledge and skills to complement their engineering expertise. They grow professionally and personally as they prepare for responsible positions in different industries. NIT graduates set out to make a positive impact on the world.

Students at NIT benefit from small study groups, interactive classes with international faculty, an intercultural learning environment, and a constant combination of theory and practice through case studies, simulations, by guest speakers, field trips, and internships.

Students with two or more years of work experience after their first university degree complete their studies at NIT with an MBA. Students with less work experience obtain a Master of Arts.

Part-time Program Technology Management (MBA or MA)

The NIT master's program is designed to be studied in part-time, with classes in the evenings, on the weekends, and during two four-week spring schools, offered in March of the first study year and in February of the second year, respectively.

Besides the double degree program, NIT offers this part-time program in Technology Management for professional engineers and scientists.

Admission Requirements

- Bachelor's degree in engineering with top grades
- High level of proficiency in English
- First professional experience is a plus

Financial Matters

The tuition fee (5,500 Euro per semester) for a master program at NIT covers all seminars and course materials at NIT. Students get individual support by NIT lecturers and administration. Social events, mentoring and career building are also included in the services.

Outstanding candidates can apply for a scholarship covering the whole tuition fee. Please note that the scholarship options are limited. Besides, there are student loans to cover the tuition, other fees or personal living cost.

Deadlines

Application deadline: March 31
For industrial scholarships:
Best before Feb. 28
Starting date: Mid-September

Contact

NIT Northern Institute of Technology Management
Admissions Team
Phone: +49 40-42878-3787
admissions@nithh.de
www.nithh.de

SYLLABUS

The NIT curriculum includes fundamental general management courses. In addition, courses like corporate responsibility, governance, business ethics, teamwork, communication and conflict management lead students to learn and reflect about how to become responsible managers and good leaders.

Principles of Economics

- Introduction to Economics
- Statistics
- Decision Theory
- Global Economy

Primary Value Chain Activities

- Supply Chain Management
- Research and Development
- Operations Management
- Marketing and Sales



ENGINEERING (M.Sc.) + TECHNOLOGY MANAGEMENT (MBA/M.A.)

Finance and Accounting

- Financial Accounting
- Management Accounting
- Corporate Finance

Strategy and Management

- Strategy
- Organization and Human Resources
- International Management

Responsibility and Law

- Principles of Philosophy and Ethics
- Good Scientific Practice and Writing
- Corporate Governance and Social Responsibility
- International Law and Intellectual Property Rights

Communication and Leadership

- Communication and Conflict Management
- Presentation
- Project Management
- Leadership and Teamwork
- Negotiation

SPECIAL EMPHASIS

Students have a choice of two specialization modules:

- **The Classic Track** offers a number of specialty courses in Technology Management, such as Technology Roadmapping, Quality Management, Current Challenges and Trends in Technology Management, and Management of IT.
- **The E-Track** encompasses project-based learning and workshops in

entrepreneurial management with a chance to test out new business ideas and models. Students develop an entrepreneurial mind-set that is beneficial for future careers in industry as well as new ventures.

German and other Foreign Languages

To equip students even better for the international work place, all students learn a foreign language in addition to English and their native language. German as a Foreign Language is compulsory for all students with German language skills below the C1 level. Learning German will help students adjust to the new environment, to learn about German culture, and to establish close ties with fellow students, mentors, and co-workers during the internship and thesis projects. International students with a proven C1 competency in German can also enroll in another language.

Internship

Students at NIT spend 3 to 5 months in industrial internships in Hamburg or other cities. The internship is designed to complement the academic studies and constitutes a key element of the overall master's program. During the internship, students gain insights into the nature and structure of German companies. They experience specific technologies in real-life settings and can observe the application of operational management.

Students who are studying in parallel to full-time employment can substitute a work project for the internship.



■ TUHH M.Sc. 120 ECTS ■ NIT MBA/M.A. 90 ECTS

* cooperation with industry partners possible

Scholarship Sponsors of the NIT





CAMPUS LIFE

University sports facilities such as the campus fitness center and a range of student clubs and societies are available to enable students to put their leisure time to good use in addition to their many study-related activities. After all, academic life at TUHH does not consist solely of study and research; it includes a wealth of other cultural options. University sport, for one, has such an extensive program that not all of its activities can be listed here. The gym alone offers the combination of a relaxed atmosphere and state-of-the-art technology with 40 exercise and cardio devices in an area of 220 square meters. Intensive supervision by a team of trainers ensures success that is documented by means of special training software that is only available at the university gym. Talks, concerts, parties, corporate presentations and much more enrich the cultural atmosphere at TUHH. On excursions you can get to know fellow-students better. Making music together, or by joining drama groups, singing in a choir, canoeing with the Water Sports AG or covering longer distances with the Academic Yacht Club. The student community's international make-up encourages intercultural exchange. Student International Organization members regularly present the culture of their home countries at Hamburg University of Technology's Summer Festival.

The services that we provide do not end when you graduate. Our graduates do not just pass out at graduation ceremonies. If they so wish, we can be at their side into their careers and beyond. Our aim is to establish friendships for life and set up a social network of alumni.

STUDENTS' ASSOCIATIONS AND HOBBY GROUPS

Bonding AG

This AG's focused on providing students insights into the working life and give opportunities to get in touch with employees of all kinds. www.bonding.de

Brewing Association Campusperle

A group of beer-enthused students and members of staff at Hamburg University of Technology. www.campusperle.net

Blue Engineering AG

www.blue-engineering.org/?page_id=12

Connected@TUHH

Supervision and support for German and international students. www.tuhh.de/connected

Distilling AG

This AG seeks to gather experience of simple fermentation, distillation and absolution of ethanole and progression to complex processes such as hydrolysis. www.tuhh.de/distilling

e-gnition Hamburg AG

www.egniton-hamburg.de

Fussball AG

An AG that is open to all students who are interested in soccer given that sport is international. Regular training sessions are held and teams take part in tournaments. www.tuhh.de/fussball-ag

IAESTE AG

Arranges internships and provides support during internships www.iaeste-hamburg.de/iaeste/home.php

IEEE AG: Student Branch

Aims to establish a network of electrical engineering and computer science and engineering students at the TUHH, arranges contacts with companies and plans events at the University. www.ieee-student-branch.de

Ingenieure ohne Grenzen (IngoG) AG

An information facility for students interested in development cooperation that coordinates options, holds workshops and provides support. ingog@tuhh.de www.tuhh.de/ingog

Mentor AG / ESN Hamburg AG

Guidance of exchange and foreign students. www.tuhh.de/mentor

SingING AG

www.tuhh.de/singing

SymphonING AG

www.symphoning.de.vu

Theater AG

www.tuhh.de/theater-ag

ArtRoom

The art project offering the students and employees of TUHH the opportunity to get together, exchange views while unleashing their creative potential! www.tuhh.de/welcome/artroom

INTERNATIONAL STUDENT ASSOCIATIONS

AstO – African Student Organisation

ag-asto@asta.tu-harburg.de
www.tuhh.de/asto

Chinese Student Association

chineseag@tu-harburg.de
www.tuhh.de/csa

ISATUHH – Indian Students Association

isatuhh@yahoo.com, isatuhh@tuhh.de
www.tuhh.de/isatuhh

Latin Students Association

latinostu-ag@tuhh.de

Türk-ING AG – Turkish Student Association

turking@tuhh.de www.tuhh.de/turking

PSA – Pakistan Student Association

psa@tuhh.de www.tuhh.de/psa

FURTHER INFORMATION

www.asta.tu-harburg.de/studentenleben/arbeitsgemeinschaften

PERSONAL EXPERIENCES

"At TUHH, I accrued highly matured and in-depth technical know-how in the field of Microelectronics and Microsystems with renowned research institutes and world class laboratories. At NIT, with its distinguished visiting faculties, I developed acumen for technology management, business, as well as ethics which are the hallmark of a technology manager. Other than studies, the program has offered me ample opportunities to develop my extracurricular and socially engaging activities. My association with the Indian students association at TUHH gave me an opportunity to help other Indian students, and to spread awareness of India through its flagship events such as India Day and at the Summer Festival. With these unique enriching experiences and together with the distinction of being honored by Chancellor Merkel of Germany, I can now proudly say that the NIT and TUHH together have given wings to my dreams."

Adarsha Kanchana, India
Microelectronics and Microsystems (TUHH), MBA and Technology Management (NIT)

"Studying at the TUHH in the JEMES program has been such a great experience for me. I have had the opportunity to study with and meet people from all over Europe and the world. I really liked how the JEMES program offered broad exposure to many different aspects of the environmental field, while at the same time providing the opportunity to select courses in a particular area of interest to gain greater depth of knowledge as well."

Katie Kinstedt, USA
Joint European Master in Environmental Studies (JEMES)

"Studying for the two year M.Sc. 'Ship

and Offshore Technology' (SOT) was a great experience, both academically and personally. Jointly offered by the University of Strathclyde and TUHH, I had the unique chance to study at two well reputed and innovative universities and live in two great cities. Due to this programme, I was able to study in the interdisciplinary field of naval architecture and offshore engineering. The future working environment is highly international and was perfectly reflected by this degree programme. Both universities offer an internationally-oriented atmosphere, making this programme much more than a pure degree programme. In many lectures and interesting group projects, I learned a lot about the offshore business and naval architecture. However, I do not want to miss the experience of working and living together with so many different nationalities either which was offered by the SOT programme."

Alan Gatzlaff, Germany
Ship and Offshore Technology (SOT)

"Pursuing a master degree at TUHH has been one of the best decisions I have ever made in my life. At TUHH, I didn't only experience a very strong academic atmosphere of a technical university but also a great international environment where I met people from all over the world. The course composed of lectures, internship, a project work and a master thesis has strengthened both my theoretical and practical background, which matches the high requirements of modern industries. Studying and working with international people has opened my mind and enriched my cultural knowledge. I really enjoy my time at TUHH both as a student and now as a researcher."

Nga Tran, Vietnam
Information and Communication Systems

"Coming to TUHH for the international master's program in environmental engineering has proven to be a great choice. Because it is an international program, I have had the opportunity to meet and work with people from all over the world, each of whom bring unique experiences and insight both academically and socially. I have specifically enjoyed the environmental engineering program. Class sizes are small and the professors have vast expertise and experience, with the effect that I wake up looking forward to most classes. Also, the environmental master's program involves several different institutes at the university, allowing us to take a variety of classes and work on projects that peak our individual interest. Having the opportunity to work as a student assistant at one institute has been another plus."

Jimmy Grimes, USA

Environmental Engineering

"The NIT/TUHH Program is both very intensive and highly fruitful for every student. Although the combined workload of NIT and TUHH is very demanding, the NIT's multicultural community as well as the excellent support from the NIT administration make it worthwhile to meet this challenge. The NIT gave me the opportunity to learn Chinese and spend a semester in Shanghai – a dream come true. It was the NIT that prepared me well for professional challenges as a strategy consultant at McKinsey & Company and that offers me great support with my ventures as an entrepreneur even years after my graduation."

Christoph Jung, Germany
Mechatronics and Technology Management (NIT)



Hamburg University of Technology
Am Schwarzenberg-Campus 1
21073 Hamburg
Germany

www.tuhh.de



TUHH – International Academic Programs



www.nithh.de

Further information

Information and admission requirements can be obtained via mail, email or internet.

For the TUHH Master's Programs: www.tuhh.de, admissions-office@tuhh.de

For the additional NIT Professional Program: www.nithh.de, admissions@nithh.de

TUHH
Hamburg University of Technology