Narvik University College
”The Technological University College in Northern Norway”

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LOCATION

• Only technological higher education establishment in Northern Norway
• Region of 480 000 inhabitants
• Region of large unexploited minerals, oil and gas reserves
• Present and future large demands for Engineers and Scientists
History

- Established in 1955
- Bachelor in Engineering from 1955
- Prequalification Course from 1976
- Department in Alta from 1986
- Master in Technology from 1990
- PhD Education from 1992, in cooperation with NTNU (among others)
- Bachelor in Nursing from 1994
- Bachelor in Pedagogic from 2000
- Bachelor in Teaching from 2005
- Bachelor in Economy and Admin. from 2005
- Prequalification Course in Bodø from 2007
- Bachelor in Engineering in Bodø from 2008
- Regional net-based BSc 2009
- Be accredited to give PhD-education (2011)
- Specialised University Institution (2012)

Size

- ~ 1500 students
- ~ 200 foreign students from 30 different nations (largest numbers from Russia and China)
  - Total staff: ~ 170
  - Academics ~ 120
  - Academics from 10 foreign countries
- Budget 2011: ~ 168 mill. NOK
- Building area: ~ 26000 m²
PhD–studies (3 years)

In cooperation with:

- Norwegian University of Science and Technology
- University of Tromsø
- Luleå Technical University in Sweden
- University of Agder
- University of Oslo

Master Programs (2 years)

- Computer Science
- Industrial Engineering
- Engineering Design
- Electrical Engineering
- Integrated Building Technology
- Space Technology
Computer Science
(Game and simulator programming)

- Advanced Object oriented programming
- GPU-programming, Meta-programming
- Geometric Modelling
- Computer Graphics/Virtual Reality/Animation
- Artificial Intelligence
- Game programming, special effects for movies.
- Scientific Computations and Simulations

Industrial Engineering

- Computer Integrated Manufacturing
- Virtual Manufacturing
- Industrial robotics
- Supply Chain Management
- Logistics
- System Engineering....
Engineering Design

- Design, geometry and design processes and methods
- Calculation of strength of shapes
- Computer modelling, virtual prototyping and simulations
- Lightweight constructions
- Modern materials and materials selection
- Scientific computing

Electrical Power Engineering

- Power electronics
- Control engineering
- Digital signal processing
- Power sources (water / windmills / solar cells etc)
- Instrumentation and measuring systems
- Electromagnetic field theory
INTEGRATED BUILDING TECHNOLOGY

- Building technology
- HVAC technology
- Energy technology
- Cold climate technology
- Indoor Environment
- Gives unique knowledge in the interaction between the building and the technical installations in engineering management, construction management and property management

Space Technology
(Satellite Systems)

- Spacecraft Dynamics and Control
- Satellite Communications
- Remote Sensing
- Environmental Surveillance
- Satellite Design
Bachelor of Engineering (3 years)

- Civil Engineering
- Computer Science
- Industrial Engineering
- Electronics Engineering
- Electrical Power Engineering
- Space Engineering
- Process Engineering

CIVIL ENGINEERING

- Building materials
- Building construction
- Construction Management
- Plant engineering
- Water supply and sewage
- Geology
- Road construction
Computer science

- **Solid base**
  - Programming, algorithms, operating systems, data communication, networking

- **In-depht**
  - Game programming
    - Games, learning systems, visualization
  - Internet applications
    - Multimedia, web programming, distributed applications

Industrial Engineering

- **Bsc degree in general Mechanical engineering**

- **Combined core curriculum cover**
  - Mechanical and Structural Design
  - Manufacturing processes
  - Energy Systems

- **Working functions in various industries:**
  - Mechanical Design
  - Maintenance
  - Project Management
Electronics Engineering

- Programming in C++
- Microcontrollers
- PC-based measurements
- Mobile- and digital communication

Power Engineering

- Electrical Power Production, Distribution and Consumption
- Electrical Machines
- Power Electronics
- High Voltage Technology
- Low Voltage Electrical Installations
- Energy, Environment and Alternative Energy Sources
Space Engineering

- **Basic Space Technology: Rockets and Balloons**
- **Instrumentation and Design for Space Environment**
- **Space Physics**
- **Remote sensing from satellite**
- **Earth observation**

Other Bachelor Programs

- **Nursing**
- **Teacher Training in Science and Technology**
- **Economy and Administration with Specialisation in Logistics or IT**
Qualifications

• Pre Qualification for Bachelor in Engineering (1 year)
• Pre Qualification for Foreign Students (1 year)
• Three Terms System

Postgraduate/Part-time Courses

• Studies in Preventive Drug-abuse
• Applied Pedagogical Guidance
• Computer Engineering
• Business Management & Economy
• Mathematics for Teachers in Primary and Secondary School
• Maintenance of Streets and Roads
• Violence and Aggressive Behaviour
Industrial cooperation – some examples

- Statoil - Melkøya
- SHELL - Shakalin
- ABB - Vallhall
- CognIT AS, Norway
- ComputeIT AS, Norway
- LKAB, Narvik and Kiruna
- Heatwork AS, Narvik
- Productive Programming Methods AS, Trondheim
- Scancell AS, Narvik
- Natech, Narvik

Research & Development

Five R&D-groups:
- Simulations/Cold Climate Technology
- Inhomogeneous Materials/Light Weight Materials
- Industrial Engineering/Waste Logistics
- Electromechanical Systems/Space Technology
- Energy Technology
Main R&D Areas at NUC
Simulations / Cold Climate Technology

- Computational Fluid Dynamics, Cold Climate Phenomena
- Computer Aided Geometric Design, Geometric Modelling, B-splines
- Game and simulation programming
- Multivariate Approximation, Interpolation, Data Fitting, Smoothing, Compression
- Wavelet Library and Database
- Initial and Boundary Problems, Finite and Boundary Element Methods
- Constrained Optimization, Variational Techniques

Homepage for the R&D group Simulations:
http://www.hin.no/simulations

Main R&D Areas at NUC
Homogenisation Theory

- Mathematical Modelling and Mechanics of Composite and Cellular Structures
- Optimal Design of different kinds of Honeycomb Structures in Cellular Sheet-, Beam- and Sandwich Structures
- Homogenisation of sequences of Non-linear Partial Differential Operators and Integral Functionals
- Asymptotic Analysis and Averaging of Partial Differential Equations and Diffusion Processes
- Stochastic Partial Differential Equations. Problems in Domains with Microscopic Geometry
- Computational Methods for Partial Differential Equations
Main R&D Areas at NUC

Industrial Engineering

- Virtual manufacturing – modelling, simulation and visualisation
- Harbour logistics
- Green logistics
- Sustainable supply chain management
- Quality management in supply chains
- Computer integrated manufacturing
- Waste management

Main R&D Areas at NUC

Electromechanical Systems

- Robust control and uncertain systems
- Energy conversion and renewable energy
- Modelling and control of industrial processes
- Signal processing, e.g. estimation and control of oscillations in noisy environments
- Distributed electrical power systems and power quality
- Control algorithms for spacecraft, e.g. formation flying of satellites
- Application of control theory to economical systems
Main R&D Areas at NUC

Energy Technology

- Modelling and simulation of energy systems
- Waterborne heat and increased energy flexibility
- Energy efficiency
- Energy planning
- Alternative and renewable energy
- Energy supplies for cold climate areas
- Bioenergy in the northern regions

New Degrees

- BSc International preparedness jointly with Norway’s Fireman School and Harstad University College

Outcome from EU Framework 7 project PRETEAR
High North Technology Centre

Field research
Selection of Research Projects

- Petromax project (NRC) on shock loading of composite subsea pipelines
- FP7 project on robotics
- FP7 project on optimisation of vehicles
- Coldtech – NRC and industry
- NRC project on Applied Mathematics
- NRC project on satellite technology
Bilateral agreements

- Beijing Institute of Petrochemical Technology, China
- Tianjin University of Technology, China
- Jiangsu Teachers University of Technology, China
- Archangelsk State Technical University, Russia
- Murmansk State Technical University, Russia
- University of Novi Sad, Serbia
- University of Sofia, Bulgaria
- University of Oulu, Finland

Erasmus agreements - 1

- University College Øresund, København, Denmark
- Institut National Polytechnique de Toulouse, Toulouse, France
- Universitet de Metz, Metz, France
- Universidad Politecnica de Valencia, Valencia, Spain
- Universidad Politecnica de Cartagena, Cartagena, Spain
- Universidad Politecnica de Madrid, Madrid, Spain
- Luleå Technical University, Luleå, Sweden
- Vilnius Pedagogical University, Vilnius, Lithuania
Erasmus agreements - 2

- Anadolu University, Eskisehir, Turkey
- Technische Universität, Dresden, Germany
- WestSachsische Hochschule, Zwickau, Germany
- Fachhochshule Lippe und Höxter, Höxter, Germany
- Budapest University of Technology and Economics, Budapest, Hungary
- State Higher Vocational School, Nowy Sacz, Poland
- Sabanci University, Istanbul, Turkey

Future plans

- Be Accredited to give PhD-education (2011)
- Specialised University Institution (specialised in Cold Climate Technology (2012)
- BSc/MSc Sustainable Energy
- MSc Architecture
- More than 20% turnover research based
The Students Welfare Organisation

- Has 279 bed site rooms and 84 self contained flats
- Internet in all houses
- Kindergarden
- Dining facilities
- Hotel
- Sportscenter

The students Welfare organisation

- Climbing hall
- Paintball hall
- Pub
- Guidance counsellor
- Bookstore
The NUC Student
Student Clubs and Society

- Photo & video
- Computing
- Football
- Jægermeister (outdoor activities)
- NUC – Extreme
- Table tennis
- Kickboxing
- Student radio
- Games
- Student choir
- Newspaper & media
- Theatre
- And more....

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