FACULTY OF NATURAL SCIENCES AND TECHNOLOGY

The "Regulations concerning the philosophiae doctor degree (PhD) at the Norwegian University of Science and Technology (NTNU)" states the following in section 2:

§ 2. Objectives of the PhD education programme
The PhD education programme has the objective of training candidates to be independent researchers who can work at an international level in cooperation with Norwegian and international research groups.

The PhD education programme has the objective of meeting the current and future requirements for research, development, supervision and dissemination within universities, other public institutions, private-sector institutions, enterprises and organizations.

The Faculty of Natural Sciences and Technology offers the following PhD Programmes:

- Biology
- Biotechnology
- Biophysics
- Physics
- Chemistry
- Chemical Engineering
- Materials Science
- Science Education

The Research Committee consists of the following members:

Chair:	Vice dean, Associate Professor Åse Krøkje
Department of Biology:	Professor Claus Bech Substitute representative: Professor Trond Amundsen
Department of Biotechnology:	Professor Turid Rustad Substitute representative: Professor Eivind Almaas
Department of Physics:	Professor Randi Holmestad Substitute representative: Professor Asle Sudbø
Department of Chemistry:	Professor Per Olof Åstrand Substitute representative: Professor Vassila Partali
Department of Chemical Engineering:	Professor Sigurd Skogestad Substitute representative: Professor Hugo A. Jakobsen
Department of Materials Science and Technology:	Professor Gabriella Tranell Substitute representative: Professor Knut Marthinsen
PhD representatives:	Paul Anton Letnes, Department of Physics Karen de Jong, Department of Biology Substitute representatives: Tor Nordam, Department of Physics Lise Cats Myhre, Department of Biology **(new election September 2010)**

The PhD education programme in general:
When applying for admission to a PhD programme, a plan for the organised academic training must be elaborated in cooperation with the main supervisor and the Department. The composition of the academic training should be a result of the topic of the thesis, the Candidate's individual needs or preferences and whether or not the Department has any special requirements.

The organised academic training is to cover a total of 30 credits, equivalent to six months of fulltime study. At least 20 credits are to be taken from courses on the curriculum in the PhD course catalogue. Up to 10 credits can be chosen from the master's level. The Faculty has approved a small selection of courses from the master's course catalogue that can be approved as PhD courses. These courses are listed in the presentations below. The academic training plan must consist of natural scientific/technological courses.

The Faculty does not accept courses like 'Scientific Writing", 'Information Retrieval' or 'Research and Society' within the 30 credits that constitute the PhD academic training plan. The same applies for certification courses, like 'Laboratory Animal Science for Researchers' and 'Radio-Immunological Measuring Techniques (Ria)'.

PhD courses from other Faculties will not automatically be accepted as PhD courses at the Faculty of Natural Sciences and Technology. This will be considered individually.

Advanced courses with variable themes, like Advanced Biology, Advanced Materials Science and Advanced Theoretical/ Experimental Physics/Biophysics are not meant to be Individual Study Syllabuses. Each realization must ordinarily be followed by a minimum of three candidates. The syllabus, date of examination and external examiner must be the same for each realization. Several realizations can be held in the same semester. There is a separate course code for individual study syllabuses (DIXIL-01).

Admission is to be formalized by a written contract "The agreement concerning admission to organised doctoral degree programme (PhD)", see section 6 in the PhD Regulations.

Forms and regulations are available from the following website:
www.ntnu.no/nt/phd/info

The Faculty arranges an Information day for all new PhD candidates each semester. Some of the topics covered are 'Conditions of Employment', 'Intellectual Property Rights/Innovation', 'Ethics and Integrity in Research' and 'the Administrative Process'. Attendance is obligatory for all new PhD candidates.

Contact information:
For information about courses, please contact either the Department or lecturer responsible. For general information about the PhD study, contact the following people at the Faculty administration office:

Higher Executive Officer Gro Neergård (Biology, Biotechnology and Chemical Engineering)
Phone: 73 59 60 03 / Email: gro.neergard@nt.ntnu.no

Higher Executive Officer Kristina Jones (before 1.10.2010) or Anne Sæther (after 1.10.2010) (Biophysics, Physics, Chemistry, Materials Science and Science Education)
Phone: 73 59 38 09 / Email: kristina.jones@nt.ntnu.no

The following courses are available at the Faculty of Natural Sciences and Technology:

Course ID	Course	Semester	Credits
DIXIL-01	Individuelt lesepensum 1 for doktorgradsstudenter *Individually Selected Syllabus 1 for Doctoral Students*	H/V	Minimum 3,0
BI8002	Avanserte metoder i biosystematikk *Advanced Biosystematics*	V11	7,5
BI8004	Evolusjonær biologi *Evolutionary Biology*	V12	7,5
BI8010	Systems Biology: Examples from Current Literature	11-12	7,5
BI8020	Insekt-plante-interaksjoner *Insect-Plant Interaction*	H10	9
BI8030	Avansert fiskebiologi *Advanced fishbiology*	V11	7,5
BI8060	Bio-optiske egenskaper og pigmentering i planter, alger og marine invertebrater *Bio Optical Properties and Pigmentation in Plants, Algae and Marine Invertebrates*	H11	7,5
BI8071	Biomarkører *Biomarkers*	H10	7,5
BI8072	Atferdstoksikologi *Behavioural Toxicology*	H10	7,5
BI8073	Genom økotoksikologi *Genome Eotoxicology*	V12	7,5
BI8081	Avansert Bevaringsbiologi *Advanced Conservation Biology*	H10	7,5
BI8091	Avansert biologi *Advanced Biology*	H10/V11	7,5
BI8092	Biologisk vitenskapsteori *Theory of Science in Biology*	V11	7,5
BO8031	Planteøkologi III Plant Ecology III	H11	7,5
ZO8020	Nevrobiologi I *Neurobiology I*	10-11	15,0
ZO8024	Akvatisk økofysiologi II *Aquatic Ecophysiology*	10-11	12,0
ZO8025	Biologiske effekter av miljøforurensninger *Biological Effects of Environmental Pollutants*	10-11	12,0
ZO8026	Temperaturfysiologi *Temperature Physiology*	H11	7,5
ZO8027	Respirasjonsfysiologi *Respiration Physiology*	H11	7,5
BT8101	Mikrobiell økologi *Microbial Ecology*	H11	9,0
BT8104	NMR i fysikalsk biokjemi og biologi *NMR in Physical Biochemistry and Biology*	V11	9,0
BT8105	Prokaryot molekylærbiologi *Prokaryote Molecular Biology*	V11	7,5
BT8106	Glykobiologi - Komplekse karbohydrater *Glycobiology - Complex Carbohydrates, Structure and Biological Functions*	H11	7,5
BT8112	Salting av Fisk *Fish Salting*	H11	5,0
BT8113	Biomaterialer *Biomaterials*	H10	7,5
BT8114	Marin biokjemi *Marine Biochemistry*	V11	7,5
BT8115	Proteinstrukturer *Protein Structures*	V11	7,5

BT8116	Eksperimentelle metoder i biopolymerkjemi og glykobiologi *Experimental Methods in Biopolymer Chemistry and Glycobiology*	V12	7,5
BT8117	Marine lipider *Marine Lipids*	V11	7,5
BT8118	Avanserte emner i systembiologi *Advanced Topics in Systems Biology*	H10	7,5
BT8119	Videregående næringsmiddelkjemi *Food Science, Advanced*	H10	9,0
FY8100	Karakterisering av faste overflater *Characterisation of Solid Surfaces*	H10	7,5
FY8102	Elektronmikroskopi og diffraksjon *Electron Microscopy and Diffraction*	H10	7,5
FY8104	Anvendelse av symmetrigrupper i fysikken *Application of Symmetry Groups in Physics*	H11	7,5
FY8105	Superkonduktivitet: Fysikk og teknologi *Superconductivity: Physics and Technology*	V11	7,5
FY8201	Polymerfysikk *Polymer Physics*	H10	7,5
FY8203	Myke materialers fysikk *Soft Condensed Matter*	V12	7,5
FY8302	Kvanteteorien for faste stoffer *Quantum Theory of Solids*	H11	7,5
FY8303	Faseoverganger og kritiske fenomener *Phase Transitions and Critical Phenomena*	V12	7,5
FY8304	Matematiske approksimasjonsmetoder i fysikken *Mathematical Approximation Methods in Physics*	H10	7,5
FY8305	Funksjonalintegral metoder i kondenserte fasers fysikk *Functional Integral Methods in Condensed Matter Physics*	H10	7,5
FY8401	Ioniserende strålings vekselvirkning med materie *Interactions of Ionizing Radiation with Matter*	V13	15,0
FY8402	Strålingsdosimetri *Dosimetry of Ionizing Radation*	V11	12,0
FY8403	Biopolymergeler og nettverk *Biopolymer Gels and Networks*	V11	7,5
FY8404	Klinisk fysikk for stråleterapi *Radiation Therapy Physics*	H10	3,8
FY8407	Avbilding ved magnetisk resonans *Magnetic Resonance Imaging (MRI)*	H10	7,5
FY8408	Magnetisk resonans, del 1 *Magnetic Resonance, Part 1*	H10	4,0
FY8502	Avansert biofysikk *Advanced Biophysics*	H10/V11	7,5
FY8503	Avansert teoretisk fysikk *Advanced Theoretical Physics*	H10/V11	7,5
FY8504	Avansert eksperimentell fysikk *Advanced Experimental Physics*	H10/V11	7,5
RFEL8091	Kunnskap, læring og kommunikasjon i naturvitenskap *Knowledge, Learning and Communication in Science*	H10	7,5
RFEL8095	Teknologi og teknologiundervisning – forskningsperspektiver *Technology and Technology Education - Research Perspektives*	V11	7,5
KJ8104	Nye metoder i organisk syntese *New Methods in Organic Synthesis*	H10	7,5
KJ8106	Avansert organisk kjemi *Advanced Organic Chemistry*	V11	7,5
KJ8200	Kjemisk billedbehandling *Chemical Image Analysis*	V11	7,5
KJ8204	Kvantitativ struktur-aktivitetsrelasjon *Quantitative Structure-Activity Relationships*	V11	7,5

KJ8205	Avansert Molekylmodellering *Advanced Molecular Modelling*	V11	7,5
KJ8206	Videregående kvantekjemiske metoder *Advanced Quantum Chemical Methods*	H10	7,5
KJ8208	Videregående irreversibel termodynamikk *Advanced Irreversible Thermodynamics*	V11	7,5
RFEL8093	Episoder fra naturvitenskapenes historie *Episodes from the History of Science*	H11	10,0
KP8100	Videregående prosess-simulering *Advanced Process Simulation*	H10 H	7,5
KP8102	Trekjemi i treforedlingsprosessene *Wood Chemistry in Pulping and Paper Making*	H11	9,0
KP8105	Matematisk modellbygging og modelltilpassing *Mathematical Modelling and Model Fitting*	H11	7,5
KP8106	Gassrensing med kjemiske absorbenter *Gas Cleaning with Chemical Solvents*	H11	9,0
KP8107	Videregående kurs i membranprosesser/væskesystemer, *Advanced Course in Membrane Separation Processes/Liquid Processes*	V11	9,0
KP8108	Videregående termodynamikk: Anvendelser innen fase- og reaksjonslikevekter *Advanced Thermodynamics : With applications to Phase and Reaction Equilibria*	H10 H	9,0
KP8110	Gassrensing med membraner, videregående *Membrane Gas Purification, advanced course*	V12	9,0
KP8115	Videregående prosessregulering *Advanced Process Control*	H10 H	7,5
KP8117	Papirfysikk og papirkjemi *Paper Physics and Paper Chemistry*	V12	9,0
KP8128	Videregående reaktormodellering *Advanced Reactor Modelling*	V11	12,5
KP8129	Kolloidkjemi for prosessindustrien *Colloid Chemistry for Process Industry*	V12	7,5
KP8130	Systembiologi, modellering og analyse *Systembiology, Modelling and Analysis*	H10 H	7,5
KP8131	Krystallisasjon og partikkeldesign *Crystallization and Particle Design*	H10/V11	7,5
KP8132	Anvendt heterogen katalyse *Applied Heterogeneous Catalysis*	H11	7,5
KP8133	Karakterisering av heterogene katalysatorer *Characterization of Heterogeneous Catalysts*	H10	7,5
KP8134	Surfaktanter og polymerer i vandig løsning *Surfactants and Polymers in Aqueous Solutions*	H10	7,5
KP8135	Videregående kurs i overflate, kolloid og polymerkjemi *Surface, Colloid and Polymer Chemistry Special Topics*	H10/V11	7,5
KP8136	Modellering av katalytiske reaksjoner *Modelling of Catalytic Reactions*	V11	7,5
KP8137	Framstilling av katalytiske materialer *Design and Preparation of Catalytic Materials*	V11	7,5
MT8101	Kinetikk for elektrodeprosesser *Electrochemical Kinetics*	10-11	12,0
MT8102	Korrosjon og overflateteknologi *Corrosion and Surface Technology*	10-11	7,5
MT8104	Lettmetallelektrolyse 1 *Lettmetallelektrolyse 1*	H10	7,5
MT8107	Korrosjon og overflateteknologi *Corrosion and Surface Technology*	11-12	10,0
MT8108	Massetransport *Mass Transfer*	H11	7,5

MT8200	Videregående kjemisk metallurgi *Advanced Chemical Metallurgy*	V11	7,5
MT8201	Videregående elektrisk reduksjonssmelting *Advanced Electrometallurgy*	H10 H	7,5
MT8205	Metallurgisk modellering av sveising *Metallurgical Modelling of Welding*	H10	7,5
MT8206	Jern og stålmetallurgi *Iron and Steel Metallurgy*	V11	7,5
MT8207	Elektronmikroskopi *Electron Microscopy*	V12	7,5
MT8208	Utmatting av metaller *Fatique of Metals*	H11	7,5
MT8209	Skadeanalyse av metaller *Failure Analysis of Metals*	V11	7,5
MT8210	Videregående støperimetallurgi *Advanced Solidification Metallurgy*	H10	7,5
MT8213	Modellering og simulering av materialers mikrostruktur *Modelling and Simulation of Materials Microstructure and Properties*	H10	7,5
MT8214	Videregående silisium – solceller *Advanced Silicon - Solar Cells*	V11	7,5
MT8215	Dislokasjonsteori anvendt på termomekanisk bearbeiding av metaller *Dislocation Theory Applied to Thermo-Mechanical Treatments of Metals*	H10	7,5
MT8216	Rekrystallisasjon og tekstur *Recrystallization and Texture*	H11	7,5
MT8218	Avansert materialvitenskap *Advanced Materials Science*	H10 H	7,5
MT8300	Lettmetallelektrolyse 2 *Electrolysis of Light Metals 2*	V11 V	7,5
MT8301	Karbonmaterialteknologi *Carbon Materials Technology*	V11 V	7,5
MT8305	Sementkjemi *Cement Chemistry*	V11 V	7,5
MT8306	Videregående keramisk materialvitenskap *Advanced Ceramics Processing*	V12	7,5
MT8307	Materialers termodynamikk *Thermodynamics of Materials*	H10	7,5
MT8308	Videregående faststoffkjemi *Advanced Solid State Chemistry*	11-12	7,5

V: spring semester
H: fall semester

Course descriptions are available at http://www.ntnu.no/studies/courses

The following master's catalogue courses are approved as PhD courses at the Faculty of Natural Sciences and Technology:

Course ID	Course	Semester	Credits
AK8002	Fiskens utviklingsbiologi *Early Life History of Fish*	V11	7,5
BI8061	Biologisk oseanografi *Biological Oceanography*	H	7,5
BT8103	Molekylær toksikologi *Molecular Mechanisms of Toxicology*	H10	7,5
FY8901	Målesensorer/transdusere *Sensors and Transducers*	H	7,5
FY8902	Atmosfærefysikk og klimaendringer *Atmospheric Physics and Climate Change*	V	7,5
FY8903	Gravitasjon og kosmologi *Gravitation and Cosmology*	V	7,5
FY8904	Numerisk fysikk *Computational Physics*	V	7,5
FY8905	Materialfysikk *Materials Physics*	H	7,5
FY8906	Biofysiske mikroteknikker *Biophysical Micromethods*	H	7,5
FY8907	Klassisk transportteori *Classical Transport Theory*	V	7,5
FY8908	Kvanteoptikk *Quantum Optics*	H	7,5
KJ8021	Stereokjemi og syntese av kirale stoffer *Stereochemistry and Synthesis of Chiral Compounds*	H	7,5
KJ8053	Analytiske metoder for industri- og miljøovervåking *Analytical Methods for Industrial and Environmental Monitoring*	H	7,5
KJ8056	Kjemiske og biologiske sensorer *Chemical and Sensors and Biosensors*	H	7,5
KJ8070	Videregående akvatisk kjemi *Advanced Aquatic Chemistry*	H	15,0
KJ8100	Organisk medisinsk og farmasøytisk kjemi *Organic Medicinal and Pharamaceutical Chemistry*	V	7,5
KJ8105	Organometalliske forbindelser i organisk syntese *Organometallic Compounds in Organic Synthesis*	V11	7,5
KJ8901	Enzymkjemi *Enzyme Chemistry*	V12	7,5
KJ8902	Molekylmodellering *Molecular Modelling*	H	7,5
KP8901	Kjemisk prosess-system teknikk *Chemical Process System Engineering*	V	7,5
KP8902	Reaktorteknologi *Reactor Technology*	V	7,5
KP8903	Reaksjonskinetikk og katalyse *Reaction Kinetics and Catalysis*	H	7,5
KP8904	Transportprosesser *Transport Phenomena*	H	7,5

V: spring semester
H: fall semester