

Studieplan 2012/2013

Master in Sustainable Manufacturing

Studieprogramkode

MSUMA

Innledning

The master study is focusing on the needs for increased knowledge on sustainable manufacturing. In other words how to migrate towards a simultaneous sustainability in economy, ecology and social issues for materials, processes, transportation and products. The master has a socio-technical perspective to sustainability with 6 sigma, agile and lean manufacturing and organizational principles as important elements.

The Master will credit 120 student points and run full time over a period of 2 years, with an opening for extending this to 4 years for part-time students. The student will receive the degree Master of Science. The master will have an international focus but will be based in the needs of the regional manufacturing industry. There will be a selection of industrial companies forming a Reference Group and signing a partner agreement. The industry in the region will act as “teaching factories” where real-life processes and products are used in the education. There will be an established system for guest-lectures given by researchers, engineers and managers from the industry in the region complementing the academic teachers. This close connection to the industry will enhance the understanding of the present challenges manufacturers are facing at the future expectations of needed competence. Each student will be offered an industrial and an academic mentor that will be an overall guide for the student throughout the studies.

The Norwegian Centre of Expertise (NCE) Raufoss is an expert centre for advanced light materials and automated manufacturing where GUC is a partner. This NCE form the basic industrial platform for the master. Selected partners in the NCE will be invited to form an industrial advisory board for the master. This board will give advices to the content and direction of the master education.

Studiets varighet, omfang og nivå

2 years, with an opening for extending this to 4 years for part-time students.

Forventet læringsutbytte

Knowledge

The student finishing the master degree will possess advanced knowledge within sustainable manufacturing with the ability to contemplate impact from decisions on industrial economics, ecology and societal aspects on a holistic level. They will possess thorough academic knowledge within the field of manufacturing including lean leadership, total productive maintenance, product development, operations management etc. all in the overall context of sustainable manufacturing. They will be able to apply and utilize the knowledge within new areas and analyze previous unknown problems and challenges and plan and organize implementations of actions. Moreover the students will be able to evaluate and discuss results from the actions.

Skills

The students will be able to defend decisions with a foundation on mathematical and scientific terms and are able to distinguish between populist “green washing” and genuine steps towards sustainable manufacturing. The students are able to work independently with a systematic and scientific approach, as well as working in a team of colleagues and suppliers/customers. They can document and communicate impact on sustainability from their decisions and actions to colleagues, other experts as well as to the general public. They are able to use scientific databases and collaborate with universities and cutting edge experts within the field of sustainable manufacturing. They will have the skills for both an abstract birds-eye view and a detailed systematic approach to a problem or challenge. The students can utilize existing methods and tools for sustainability assessments, and adapt these to their own organization and local needs. The students are able to evaluate sources of information in a scientific way and structure and formulate professional and logical reasoning. The students will contribute to innovations and fresh thinking within the manufacturing industry contributing to the overall sustainability. The students will be able to re-think and change the applied methods according to changing demands and markets.

General Competence

The students will through the master education develop knowledge, skills, ethics and behaviour promoting the move towards sustainable manufacturing of sustainable products. The students will be able to influence on colleagues, suppliers and customers and contribute to shape the basic values for future manufacturing. On the other hand will the student be able to have respect for divergent opinions and acknowledge. There is often a need for a multidisciplinary approach to reach a holistic improved solution.

Målgruppe

This education primary target is national and international students with an engineering background from technology, economics and/or management who is planning for a career in the manufacturing industry. These students’ wants to have an advanced understanding of how the dimensions on sustainability impact future management of manufacturing, and how economic, ecologic and societal aspects can be combined in a triple bottom line. The master education will also target students who seek an academic career with research within the field of sustainable manufacturing or related research fields.

The master study should be suited both for candidates with working experience and young students directly from their bachelor degree. With flexible learning through Internet, both remote students and students taking the masters degree part time while they are continuing working are welcome. People with bachelor degree working in regional manufacturing industry will be an especially important target group, and the flexible teaching will be adapted to the need of the industry where problems and challenges form their own organization can be cases for the education.

Students entering the master study should preferably have basic knowledge on statistical distributions and analysis, lean manufacturing, project management, organization and leadership, materials technology and manufacturing processes either from practical work life or from their pervious bachelor degree studies.

For students with a 2-year engineer education or similar, there will be offered a 1 year pre-study to fulfill the requirements.

Opptakskrav og rangering

A student for the Master degree study requires a Bachelors degree according to the Norwegian

framework for bachelor in engineering, bachelor in economics or equivalent. Applicants must have knowledge of English. For international students without a Bachelor degree from an English speaking university, a TOEFL test result of at least 600 points (computerized 250 points, on Internet 100 points) or IELTS test result of at least 6.0, including at least 6.5 is preferably.

Studiets innhold, oppbygging og sammensetning

The education will provide the students with a broad foundation for sustainable manufacturing. The education will be based upon contemporary research in the field. The Master program is interdisciplinary and consists of 8 courses, an TØL4081 Industry Project and a TØL4901 Master Thesis. The courses at each semester will run in parallel throughout the semester before ending in a final examination. The overall structure is:

Basic courses: TØL4001 Philosophies of Social Science, IMT4421 Scientific Methodology, TØL4021 Management and Leadership for Sustainability, TØL4031 Quality and Risk Management, TØL4041 Sustainable Development and TØL4011 Early Assessment of Projects

In-depth courses: TØL4061 Sustainable Manufacturing Systems, TØL4051 Information Systems Strategy, TØL4071 Product Development for Sustainability and TØL4081 Industry Project

The master is finalized with a TØL4901 Master Thesis.

1st Semester

The first semester main focus is basic learning of Scientific methods and philosophy, project management and management and organizations theory. The semester contains the following basic courses all running in parallel:

1. TØL4001 Philosophies of Social Science
2. IMT4421 Scientific Methodology
3. TØL4011 Early Assessment of Projects
4. TØL4021 Management and Leadership for Sustainability

The course on TØL4001 *Philosophies of Social Science* will give the students knowledge about philosophies of social science which gives the students a basis for understanding social science research, choose research methods and how to interpret other researches philosophical standpoint.

IMT4421 *Scientific Methodology* which is a co-operation with the Faculty of Computer Science and Media Technology at HiG (course IMT4421) will give the students knowledge about theory of science, research methodologies and how to plan, study literature, carry out searches in databases, handle research data and document work in a scientific way.

These two courses will be an important base for the TØL4081 Industry Project and the TØL4901 Master Thesis in 3rd and 4th semester.

TØL4011 *Early Assessment of Projects* will give the students necessary learning about the project early phase where most of the factors that are decisive on sustainability is decided. The learning outcome of this course will be valuable for the TØL4081 Industry Project and the TØL4901 Master

Thesis in 3rd and 4th semester. The courses TØL4031 *Quality and Risk Management* in the 2nd semester and TØL4071 *Product Development for Sustainability* in the 3rd semester are based on this course.

TØL4021 *Management and Leadership for Sustainability* will give the students necessary basic knowledge on the Management, leadership and organisational development. This course will be a basis for the course on TØL4051 *Information Systems Strategy* in 2nd semester.

2nd Semester

The 2nd semester focus on quality, risk, scientific methods and ICT. The semester contains the two last basic courses:

1. TØL4031 *Quality and Risk Management*
2. TØL4041 *Sustainable Development*. The semester will also contain the first in-depth course:
3. TØL4051 *Information Systems Strategy*

TØL4031 *Quality and Risk Management* builds on some of the topics from the course in early assessment of project, but will elaborate the learning outcome of statistical methods for quality and risk management. The Six-sigma paradigm, process variations, measuring systems assessment are new aspects in this course.

TØL4041 *Sustainable Development* will give the basic introduction to sustainability. The understanding of the concept of sustainability with triple bottom line, Life cycle assessment, remanufacturing and cross flow analysis are important parts of this course. This course is a basis for TØL4061 *Sustainable Manufacturing Systems* and TØL4071 *Product Development for Sustainability*, both in the 3rd semester.

TØL4051 *Information Systems Strategy* is the first in-depth course, and will give the students knowledge and skills on how to implement and manage information systems including the increasingly important and numerous Information Technology (IT) systems within organisations and companies.

3rd Semester

The previous two semesters have been mainly basic courses. In the 3rd semester, however, the students will enter the in-depth study of sustainable manufacturing. The semester has two in-depth studies as well as the project work:

1. TØL4061 *Sustainable Manufacturing Systems*
2. TØL4071 *Product Development for Sustainability*
3. TØL4081 *Industry Project*

The course TØL4061 *Sustainable manufacturing system* is addressing the manufacturing processes and system including operations management. The course on TØL4041 *Sustainable Development* is on basis of this course which will elaborate the sustainability aspects for manufacturing as well as giving more elaborate learning on value chains and material flow. Selection of manufacturing processes and

total productive maintenance (TPM) are new to the students in this course. The course on TØL4071 *Product Development for Sustainability* will give the students learning on product development methodology for sustainable products. This course relies heavily on the Life Cycle Assessment the students have learned in the TØL4041 Sustainable Development course in 2nd semester. The basis for the TØL4081 *Industry Project* is more or less all of the other courses (except the thesis) since the project work should give the student a practical training on their total acquired knowledge within an industrial setting. The TØL4081 *Industry Project* can be individual but is preferably done as a team work. The project work is normally a pre-project to the TØL4901 Master Thesis filling the complete 4th and last semester where the students will get a training to work independent with a project with a systematic and scientific approach.

4th Semester

The 4th semester is entirely dedicated to the TØL4901 Master Thesis. The thesis should preferably be conducted in collaboration with one or more industrial companies, usually including the company where the student's industrial mentor is located. There is a requirement that at least 70 ECTS of the master program courses are passed before the TØL4901 Master Thesis can be approved.

Working Methods for the Flexible Master Degree

The on-campus students will follow normal lectures as well as group work, colloquiums/tutorials, and practical training. There will be an extensive use of real-life industrial cases in the study and some of the practical training will be situated in industrial companies within the region. The master is, however based on flexible learning methods and internet and digital tools are used both for on- and off- campus students.

Thus, students and lecturers may be separated in space and time by using flexible learning methods, and communication and courses will partly or entirely be available for the student independent of place, space and time. Course material will be structured by means of a Learning Management System (LMS). Each course will have designated virtual classrooms in the LMS, and the LMS will be used for communicating all learning material, exercises, hand-ins and course administrative matters.

Lectures will be made available by using different types of technology. Streaming, recording and publishing of campus lectures, pre-recording of shorter learning objects or use of web conferences technology are methods available. Some lectures will be offered in synchronous mode, while others may be asynchronous depending on the course's form and content. Collaboration is a well-acknowledged method for learning, and tools that will help distance students manage working together will be offered, for instance web conference tools.

Students and lecturers will be able to communicate through the Learning Management System or through live web conferences on line. Feedback on student work is an important part of student-lecturer communication. Tutoring will be emphasized; either one to one (student - lecturer) or one to many (students – lecturer), and this can also be executed in a synchronous or asynchronous manner. Tutoring will mainly be given on specific student work.

Some of the practical training, colloquiums and group work will, however, be performed with all students on campus (or in such a case within a industrial company). These face-to-face meeting periods

will be coordinated among the courses at the same semester, in order to minimize the need for travel.

Examinations, depending on examination method, will both be on the Gjøvik University campus, as well as home examination. In the case of written exam there is also flexibility, as students will be able to sit their examinations in a place close to their home or work place.

Tekniske forutsetninger

Gjøvik University College will ensure that the students have access to the following technical requirements:

- Discrete event simulations software
- Manufacturing process laboratories at SRM and GUC
- The university library facilitates with computers for this purpose
- Availability of computers and necessary software
- Systems for internet based education

There is a benefit but not a demand that the full-time students on the campus have access to private computers. Students following flexible Internet based education need access to a computer. The students will be given training in HES issues for laboratories and industrial environments, and access to necessary safety equipment such as protective glasses and shoes.

Sensorordning

The TØL4901 Master Thesis and the project work will have one internal and one external censor. The TØL4901 Master Thesis will in addition have one or two student opponents. The courses and the project work will have internal censors, and external sensor each 4th year, starting with courses 1 and 4 in 2012, 2 and 5 in 2013, 3 and 6 in 2014 and so forth.

Internasjonalisering

The courses will be conducted in English. This will ensure the possibility for international students to apply and collaboration with international universities to exchange students and research personnel. There will be invited lectures from international partners and exchange of students with international partners is welcomed. GUC will active promote students to study one semester abroad, on the condition that similar courses can be found on the collaboration university. This must be approved by GUC in each separate case after an application from the students. An exchange in the last semester when the students are working on her/his thesis is a possibility, preferably in collaboration with the student's industrial mentor (for example where there is a collaboration university as well as a company manufacturing site close by).

GUC are actively participation in research project with the following partners: Chalmers University of technology in Sweden, École Polytechnique Fédérale de Lausanne in Switzerland, University of Stuttgart and Fraunhofer geschellschaft in Germany, Université de Technologie Compiègne in France, National Technical University of Ukraine and National Institute of Advanced Industrial Science and Technology in Japan. This includes one research project within the 7th Framework program: *Sustainable and Efficient Production of Lightweight Solutions* (NMP.2010.3.1-1) where master students writing their TØL4901 Master Thesis can be active participants.

Klar for publisering

Ja

Godkjenning

Godkjent av NOKUT 17.01.12

Opprettelse av studiet godkjent av Kunnskapsdepartementet februar 2012.

Studieprogrammet vedtatt av Høgskolestyret sak STY 61/10.

Studieplanen er godkjent i studienemnda 31. januar 2012.

Utdanningsnivå

Mastergrad

Studiekode ved Samordnet Opptak (SO-kode)

207 1017

Master of Science in Sustainable Manufacturing 2012-2014 Full time

Emnekode	Emnets navn	O/V *)	Studiepoeng pr. semester			
			S1(H)	S2(V)	S3(H)	S4(V)
TØL4002	<u>Samfunnsvitenskapelig filosofi</u>	O	5			
TØL4011	<u>Early assessment of projects</u>	O	10			
TØL4021	<u>Management and Leadership for Sustainability</u>	O	10			
IMT4421	<u>Scientific methodology</u>	O	5			
TØL4051	<u>Information Systems Strategy</u>	O		10		
TØL4031	<u>Quality and Risk Management</u>	O		10		
TØL4041	<u>Sustainable development</u>	O		10		
TØL4061	<u>Sustainable manufacturing systems</u>	O			10	
TØL4081	<u>Project Work</u>	O			10	
TØL4071	<u>Product Development for Sustainability</u>	O			10	
TØL4901	<u>Master Thesis</u>	O				30
Sum:			30	30	30	30

*) O - Obligatorisk emne, V - Valgbare emne

Master of Science in Sustainable Manufacturing 2012-2016 - Recommended distribution of courses for a four year part time track

Emnekode	Emnets navn	O/V *)	Studiepoeng pr. semester							
			S1(H)	S2(V)	S3(H)	S4(V)	S5(H)	S6(V)	S7(H)	S8(V)
IMT4421	<u>Scientific methodology</u>	O	5							
TØL4011	<u>Early assessment of projects</u>	O	10							
TØL4041	<u>Sustainable development</u>	O		10						
TØL4003	<u>Philosophies of social science</u>	O			5					
TØL4021	<u>Management and Leadership for Sustainability</u>	O			10					
TØL4031	<u>Quality and Risk Management</u>	O				10				
TØL4151	<u>Life Cycle Assessment</u>	O					5			
TØL4161	<u>Sustainable Products Innovations</u>	O					5			
TØL4051	<u>Information Systems Strategy</u>	O						10		
TØL4061	<u>Sustainable manufacturing systems</u>	O							10	
TØL4081	<u>Project Work</u>	O							10	
TØL4901	<u>Master Thesis</u>	O								30
Sum:			15	10	15	10	10	10	20	30

*) O - Obligatorisk emne, V - Valgbare emne

Emneoversikt

TØL4002 Samfunnsvitenskapelig filosofi - 2012-2013

Emnekode:

TØL4002

Emnenavn:

Samfunnsvitenskapelig filosofi

Faglig nivå:

Master (syklus 2)

Studiepoeng:

5

Varighet:

Høst

Varighet (fritekst):

Siste halvdel av semesteret

Språk:

Engelsk

Forventet læringsutbytte:

Etter endt emne skal studenten:

Kunnskap

- ha inngående kunnskap om sentrale spørsmål innen samfunnsvitenskapelig teori
- kunne analysere sentrale problemstillinger innen samfunnsvitenskapelig teori

Ferdigheter

- foreslå en vitenskapelig problemstilling som egner seg for kvalitativ forskning
- selvstendig kunne planlegge gjennomføringen av et vitenskapelig arbeid

Generell kompetanse

- kunne rapportere resultater fra vitenskapelige prosjekter, deriblant egenutførte vitenskapelige arbeider
- ha utviklet bevisste etiske holdninger i forhold til hvordan vitenskapelig metodikk kan brukes til å tilstrebe en bærekraftig utvikling av nærings- og samfunnsliv

Emnets temaer:

- Introduksjon til samfunnsvitenskapsteori
- Paradigmer og retninger innen samfunnsforskning
- Kvantitative og kvalitative forskningsdesign
- Hva karakteriserer gode problemstillinger og hvordan lager man en
- Litteraturstudier
- Metodevalg, inkludert planlegging, gjennomføring, og analyse av eksperimenter/studier.
- Bruk av forskningsdatabaser for problemløsning og forbedring
- Behandling av data/statistikk
- Utarbeidelse av prosjektplan
- Aksjonsbasert forskning - metodikk og filosofi
- Forskningsetikk
- Fokus på framveksten av næringslivsetikk og virksomheters samfunnsansvar

Pedagogiske metoder:

Essay
Forelesninger
Nettbasert Læring
Prosjektarbeid
Veiledning

Pedagogiske metoder (fritekst):

The course will be made accessible for both campus- and remote students. Every student are free to choose the pedagogic arrangement form that are best fitted for her/his own requirement.

The lectures in the course will be given on campus and are open for both categories of students. Lectures that sums up the main issues in the lecture will also be available on internet through GUC's learning management system (ClassFronter).

Tutoring are given at campus in accordance to announced times. In addition there will be at least on gathering at campus for remote students with mandatory laboratory exercises.

Tutoring is also available on internet.

Vurderingsformer:

Skriftlig eksamen, 3 timer

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

Intern sensor

Utsatt eksamen (tidl. kontinuasjon):

Ordinær kontinuasjonseksamen

Tillatte hjelpemidler:**Tillatte hjelpemidler (gjelder kun skriftlig eksamen):**

Engelsk ordbok

Obligatoriske arbeidskrav:

Godkjent essay

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Førsteamanuensis Halvor Holtskog

Læremidler:

Arbnor, I. og B. Bjerke (2008) *Methodology for Creating Business Knowledge* . London: Sage

Samt tilleggs litteratur, utdelt eller gjort tilgjengelig i Fronter.

Erstatter:

TØL4001

Klar for publisering:

Ja

TØL4011 Early assessment of projects - 2012-2013

Emnekode:

TØL4011

Emnenavn:

Early assessment of projects

Faglig nivå:

Master (syklus 2)

Studiepoeng:

10

Varighet:

Høst

Språk:

Engelsk

Forventet læringsutbytte:

After completing the course, the student is supposed to

Knowledge

- be able to define, execute and select methods and tools to evaluate various concepts at an early stage.

Skills

- be able to use appropriate evaluation methods to identify and analyze concepts at an early stage.

General competence

- by practical project work demonstrate knowledge on how to ensure the best possible concept and improve social sustainability in projects.

Emnets temaer:

Methods and tools in the early phase:

- system analysis
- strategy analysis - a logical framework
- analysis of uncertainty
- strategic framework
- probability based cost analysis
- profitability and sustainability assessment
- risk analysis
- probability based propulsion analysis

Pedagogiske metoder:

Forelesninger
Prosjektarbeid
Veiledning

Pedagogiske metoder (fritekst):

The course will be made accessible for both campus- and remote students. Every student are free to choose the pedagogic arrangement form that are best fitted for her/his own requirement.

The lectures in the course will be given on campus and are open for both categories of students. Lectures that sums up the main issues in the lecture will also be available on internet through GUC's learning management system (ClassFronter).

Tutoring are given at campus in accordance to announced times. In addition there will be at least on gathering at campus for remote students with mandatory laboratory exercises.

Tutoring is also available on internet.

Vurderingsformer:

Skriftlig eksamen, 4 timer

Vurderingsformer:

Written Exam, 4 hours

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

2 Internal Examiners

Utsatt eksamen (tidl. kontinuasjon):

Next ordinary exam

Tillatte hjelpemidler:**Tillatte hjelpemidler (gjelder kun skriftlig eksamen):**

All printed and written

Obligatoriske arbeidskrav:

Two passed projects

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Professor Kristian Martinsen

Læremidler:

Frank A. Wilson: "Towards Sustainable Project Development", 1997

Richard Maltzman, David Shirley: "Green Project Management", 2011

Klar for publisering:

Ja

TØL4021 Management and Leadership for Sustainability - 2012-2013

Emnekode:

TØL4021

Emnenavn:

Management and Leadership for Sustainability

Faglig nivå:

Master (syklus 2)

Studiepoeng:

10

Varighet:

Høst

Språk:

Engelsk

Anbefalt forkunnskap:

Expected organisational knowledge on Bachelor level:

- Pre Knowledge of: Lean Manufacturing
- Basic knowledge of organization and management

Forventet læringsutbytte:

After completing the course, the student is supposed to

Knowledge

- Thorough knowledge of theory and practice in managing organizations
- Thorough knowledge of the role of sustainable leadership
- Thorough knowledge of basic concepts, principles and philosophy for Lean and learning organizations
- Thorough knowledge of the role of management and leadership in Lean
- Thorough knowledge of the importance of team work, participation and the Norwegian model in relation to Lean
- Reflect and plan for implementation effective and efficient organization with a sustainable and global perspective

Skills

- Develop managerial skills for future learning organizations

Competence

- Be aware of the history organizational and managerial theory
- Aware of the history of Lean development
- Understanding different managerial fads and fashions

Emnets temaer:

- History of organization and management theory
- Sustainable organization, management and leadership
- Managing individuals
- Managing teams and groups
- Leading, coaching and motivating
- Managing human resources and cultures
- Power, politics and decision-making
- Communication
- Knowledge and Learning
- Innovation and change
- Ethics and corporate social responsibility
- Philosophy of Lean, principles and culture
- Lean leadership, management and organization
- The Nordic/Norwegian model and Lean – work organization and participation

Pedagogiske metoder:

Forelesninger
Gruppearbeid

Pedagogiske metoder (fritekst):

The course will be made accessible for both campus- and remote students. Every student are free to choose the pedagogic arrangement form that are best fitted for her/his own requirement.

The lectures in the course will be given on campus and are open for both categories of students. Lectures that sums up the main issues in the lecture will also be available on internet through GUC's learning management system (ClassFronter).

Tutoring are given at campus in accordance to announced times. In addition there will be at least on gathering at campus for remote students with mandatory laboratory exercises.

Tutoring is also available on internet.

Vurderingsformer:

Skriftlig eksamen, 4 timer

Vurderingsformer:

4 hours written exam

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

Two internal examiners

Utsatt eksamen (tidl. kontinuasjon):

Next ordinary exam

Tillatte hjelpemidler:**Tillatte hjelpemidler (gjelder kun skriftlig eksamen):**

English dictionary

Obligatoriske arbeidskrav:

Two individual works to be presented both written and orally. They will be evaluated.

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Professor Tom Johnstad

Læremidler:

Cole and Kelly (2011): Management Theory and Practice, Cengage Learning EMEA, 7th edition

Thompson & McHugh (2009). Work organisations. A critical approach. Basingstoke: Palgrave Macmillan

Liker & Convis (2011). The Toyota Way to Lean Leadership. McGraw-Hill

Collection of articles available in Fronter

Klar for publisering:

Ja

IMT4421 Scientific methodology - 2012-2013

Emnekode:

IMT4421

Emnenavn:

Scientific methodology

Faglig nivå:

Master (syklus 2)

Studiepoeng:

5

Varighet:

Høst

Varighet (fritekst):

Første halvdel av semesteret

Språk:

Engelsk

Forventet læringsutbytte:

Etter endt emne skal studenten

Kunnskap

- kunne analysere sentrale problemstillinger innen vitenskapsteori
- ha inngående kunnskap om sentrale spørsmål innen vitenskapsteori
- kjenne sentral terminologi for vitenskapelige arbeider

Ferdigheter

- foreslå en vitenskapelig problemstilling
- selvstendig kunne planlegge gjennomføringen av et vitenskapelig arbeid
- kunne søke etter akademiske publikasjoner ved hjelp av sentrale databaser for dette
- kunne tilrettelegge og analysere data fra vitenskapelige prosjekter

Generell kompetanse

- kunne lese og analysere akademiske publikasjoner
- kunne rapportere resultater fra vitenskapelige prosjekter, deriblant egenutførte vitenskapelige arbeider
- ha utviklet bevisste etiske holdninger i forhold til hvordan vitenskapelig metodikk anvendes

Emnets temaer:

- Introduksjon til vitenskapsteori
- Hva kjennetegner god forskning
- Forskningsetikk
- Forskning som middel til systematisk fremgang
- Kvantitative og kvalitative forskningsdesign
- Hva karakteriserer gode problemstillinger og hvordan lager man en
- Litteraturstudier
- Metodevalg, inkludert planlegging, gjennomføring, og analyse av eksperimenter/studier.
- Bruk av forskningsdatabaser for problemløsning og forbedring
- Behandling av data/statistikk
- Utarbeidelse av prosjektplan
- Gjennomføring av risikoanalyse og gjennomførbarhetsanalyse

Pedagogiske metoder:

Essay
Forelesninger
Nettbasert Læring
Prosjektarbeid
Veiledning

Pedagogiske metoder (fritekst):

The course will be made accessible for both campus and remote students. Every student is free to choose the pedagogic arrangement form that is best fitted for her/his own requirement. The lectures in the course will be given on campus and are open for both categories of students. All the lectures will also be available on Internet through GUC's learning management system (ClassFronter).

Vurderingsformer:

Skriftlig eksamen, 3 timer

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

Intern og ekstern sensor.

Utsatt eksamen (tidl. kontinuasjon):

Ordinær kontinuasjons eksamen.

Tillatte hjelpemidler:**Tillatte hjelpemidler (gjelder kun skriftlig eksamen):**

Engelsk ordbok.

Obligatoriske arbeidskrav:

Godkjent essay

Gjennomført praktisk prosjekt

Ansvarlig avdeling:

Avdeling for informatikk og medieteknikk

Emneansvarlig:

Førstelektor Frode Volden

Læremidler:

Leedy, P D, and Ormrod, J E: "Practical Research, -Planning and design, 9th ed." Pearson Educational Int. ISBN-10: 0131365665

Samt tilleggslitteratur, utdelt eller gjort tilgjengelig i Fronter.

Klar for publisering:

Ja

Emneside (URL):

<http://www.hig.no/imt/mt/emnesider/imt4421>

TØL4051 Information Systems Strategy - 2012-2013

Emnekode:

TØL4051

Emnenavn:

Information Systems Strategy

Faglig nivå:

Master (syklus 2)

Studiepoeng:

10

Varighet:

Vår

Språk:

Engelsk

Anbefalt forkunnskap:

TØL4021 Management and Leadership for Sustainability

Forventet læringsutbytte:

After completing the course, the student is supposed to

Knowledge:

- Have advanced knowledge about the fundamentals and key aspects of strategic information management
- Understand the effects of Information systems strategy planning, development, implementation and validation
- Have advanced knowledge about Knowledge Management and Information Technology Management

Skills:

- Communicate results and conclusions both oral and written with the discussion of knowledge and arguments which these are based on
- Manage, organize and structure development and maintenance of Information Systems
- Evaluate and suggest Information Systems regarding to organizational strategic goal and business benefits
- Identify and analyze key components in an organizations IT platform and Information Systems

General competence:

- Describe the role of Information Systems and IT Management have
- Understand how decisions about IT and management affects individuals, groups and organization

Emnets temaer:

- Conceptual developments in Information Systems Strategy
- Information systems management , stages of growth
- Strategic Informations systems planning (SISP)
- Information strategy model
- Information technology strategy
- Knowledge management strategy

Pedagogiske metoder:

Annet

Pedagogiske metoder (fritekst):

The course will be made accessible for both campus- and remote students. Every student are free to choose the pedagogic arrangement form that are best fitted for her/his own requirement.

The lectures in the course will be given on campus and are open for both categories of students. Lectures that sums up the main issues in the lecture will also be available on internet through GUC's learning management system (ClassFronter).

Tutoring are given at campus in accordance to announced times. In addition there will be at least on gathering at campus for remote students with mandatory laboratory exercises.

Tutoring is also available on internet.

Vurderingsformer:

Annet

Vurderingsformer:

Essay, value quality on final paper

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

2 internal examiners

Utsatt eksamen (tidl. kontinuasjon):

New deadline for improved paper

Tillatte hjelpemidler:**Obligatoriske arbeidskrav:**

- 5 assignments and 60% of assignments passed
- Participate in at least 50% of the tutorials

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Professor Kristian Martinsen

Læremidler:

Galliers, B. and Leidner, D.E. Eds. "Strategic Information Management – Challenges and Strategies in Managing Information Systems" 4th ed. 2009. Routledge.

Klar for publisering:

Ja

TØL4031 Quality and Risk Management - 2012-2013

Emnekode:

TØL4031

Emnenavn:

Quality and Risk Management

Faglig nivå:

Master (syklus 2)

Studiepoeng:

10

Varighet:

Vår

Språk:

Engelsk

Anbefalt forkunnskap:

TØL4011 Early assessment of projects

Forventet læringsutbytte:

After completing the course, the student is supposed to

Knowledge :

- be able to apply thorough knowledge of uncertainty analysis, FMEA, random sampling, and modeling of statistical process control.

Skills :

- be able to define and analyze the efficiency and the companies value chain and develop sustainable processes. -
- be able to apply various statistical distributions.

General competence:

- be able to define and execute Quality and Risk Management analysis in companies

Emnets temaer:

- Uncertainty analysis and measurement techniques
- FMEA, failure mode and effect analysis
- Random sampling
- Fault tree analysis
- Modeling of statistical process control

Pedagogiske metoder:

Forelesninger
Gruppearbeid
Veiledning

Pedagogiske metoder (fritekst):

The course will be made accessible for both campus- and remote students. Every student are free to choose the pedagogic arrangement form that are best fitted for her/his own requirement.

The lectures in the course will be given on campus and are open for both categories of students. Lectures that sums up the main issues in the lecture will also be available on internet through GUC's learning management system (ClassFronter).

Tutoring are given at campus in accordance to announced times. In addition there will be at least on gathering at campus for remote students with mandatory laboratory exercises.

Tutoring is also available on internet.

Vurderingsformer:

Skriftlig eksamen, 4 timer

Vurderingsformer:

Written Exam, 4 hours

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

2 Internal examiners

Utsatt eksamen (tidl. kontinuasjon):

Next ordinary exam

Tillatte hjelpemidler:**Tillatte hjelpemidler (gjelder kun skriftlig eksamen):**

All printed and written

Obligatoriske arbeidskrav:

Evaluation of two projects

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Assistant professor Inger A. Gamme

Læremidler:

Aikens, C. Harold: Quality Inspired Management. ISBN nr: 9780131197565.

Supplementary literature : see information in Fronter

Klar for publisering:

Ja

TØL4041 Sustainable development - 2012-2013

Emnekode:

TØL4041

Emnenavn:

Sustainable development

Faglig nivå:

Master (syklus 2)

Studiepoeng:

10

Varighet:

Vår

Språk:

Engelsk

Forventet læringsutbytte:

After completing the course, the student is supposed to have

KNOWLEDGE:

- Knowledge about common items on sustainable development: history, globalization, world community documents
- Knowledge about sustainability indicators, indexes and monitoring methods
- Knowledge about sustainable resource management

SKILLS:

- Sustainable development assessment
- Life cycle assessment (LCA)
- Use of software for LCA (Simapro)

GENERAL COMPETENCE:

- Society: understanding what society's institutions are, their role in transformation and development; understanding what democratic systems are, their role in providing with opinion representation, consensus reinforcement and overcoming disagreements.
- Environment: conscience what resources physical environment has, how much environment is instable and how it is influenced by human activity and decisions with showing settled intention to account ecological disquietudes within development of social and economic policy.
- Economic-technological line: consideration of all limitations and potential opportunities related to economic growth and their influence on society and environment when aspiring for determination of the private and public consumption level that causes concern in the context of environment and social justice.

Emnets temaer:

- Common items on sustainable development
 - Prehistory and main sustainable development concepts
 - Globalization and sustainable development problems
 - World community's main documents for sustainable development
- Sustainable development assessment
 - Sustainable development indicators.
 - Sustainable development indices
 - Environmental monitoring
- Sustainable resource management
 - Natural capitalism.
 - Basics of the natural resource management theory
 - Modeling systems
- Technological dimension of sustainable development
 - Sustainable development, technology and engineering
 - Sustainable energy
 - Cleaner production approach
 - Environmental management systems.
 - Life cycle assessment
 - Environmental labels and declaration

Pedagogiske metoder:

Annet

Pedagogiske metoder (fritekst):

The course will be made accessible for both campus- and remote students. Every student are free to choose the pedagogic arrangement form that are best fitted for her/his own requirement.

The lectures in the course will be given on campus and are open for both categories of students. Lectures that sums up the main issues in the lecture will also be available on internet through GUC's learning management system (ClassFronter).

Tutoring are given at campus in accordance to announced times. In addition there will be at least on gathering at campus for remote students with mandatory laboratory exercises.

Tutoring is also available on internet.

Vurderingsformer:

Hjemmeeksamen, 12 timer

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

2 internal examiners

Utsatt eksamen (tidl. kontinuasjon):

Next exam

Tillatte hjelpemidler:

Obligatoriske arbeidskrav:

4 individual works – 3 must be approved before the final exam

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Stipendiat Jan Olav Endrerud

Læremidler:

Compendium made by Prof Gennadiy Statyukha

Support literature:

- Sustainability in manufacturing: recovery of resources in product and material cycles Günther Seliger Springer, 2007 - Business & Economics - 423 pages
- Handbook of environmentally conscious manufacturing, Christian Ndubisi Madu, Springer, 2001 - 488 pages
- Environmentally conscious mechanical design, Myer Kutz, John Wiley and Sons, 2007 - Technology & Engineering - 394 pages
- Environmentally conscious manufacturing, Myer Kutz, John Wiley and Sons, 2007 - Technology & Engineering - 343 pages
- Sustainable development in practice: case studies for engineers and scientists, Adisa Azapagic, Slobodan Perdan, Roland Clift, John Wiley and Sons, 2004 - Business & Economics - 446 pages

Klar for publisering:

Ja

TØL4061 Sustainable manufacturing systems - 2013-2014

Emnekode:

TØL4061

Emnenavn:

Sustainable manufacturing systems

Faglig nivå:

Master (syklus 2)

Studiepoeng:

10

Varighet:

Høst

Språk:

Engelsk

Anbefalt forkunnskap:

se engelsk versjon

Forventet læringsutbytte:

se engelsk versjon

Emnets temaer:

se engelsk versjon

Pedagogiske metoder:

Forelesninger

Gruppearbeid

Pedagogiske metoder (fritekst):

se engelsk versjon

Vurderingsformer:

Annet

Vurderingsformer:

se engelsk versjon.

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

se engelsk versjon

Utsatt eksamen (tidl. kontinuasjon):

se engelsk versjon

Tillatte hjelpemidler:

Tillatte hjelpemidler (gjelder kun skriftlig eksamen):
se engelsk versjon

Obligatoriske arbeidskrav:
se engelsk versjon

Ansvarlig avdeling:
Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:
Associate Professor Rhythm Suren Wadhwa

Læremidler:
se engelsk versjon

Klar for publisering:
Ja

TØL4081 Project Work - 2013-2014

Emnekode:

TØL4081

Emnenavn:

Project Work

Faglig nivå:

Master (syklus 2)

Studiepoeng:

10

Varighet:

Høst

Språk:

Engelsk

Forventet læringsutbytte:

se engelsk versjon

Emnets temaer:

se engelsk versjon

Pedagogiske metoder:

Annet

Pedagogiske metoder (fritekst):

se engelsk versjon

Vurderingsformer:

Vurdering av prosjekt(er)

Vurderingsformer:

se engelsk versjon

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

se engelsk versjon

Utsatt eksamen (tidl. kontinuasjon):

se engelsk versjon

Tillatte hjelpemidler:**Obligatoriske arbeidskrav:**

se engelsk versjon

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Professor Kristian Martinsen

Klar for publisering:

Ja

TØL4071 Product Development for Sustainability - 2013-2014

Emnekode:

TØL4071

Emnenavn:

Product Development for Sustainability

Faglig nivå:

Master (syklus 2)

Studiepoeng:

10

Varighet:

Høst

Språk:

Engelsk

Anbefalt forkunnskap:

TØL 4011 Early assessment of projects

TØL4041 Sustainable development

Forventet læringsutbytte:

After completing the course, the student is supposed to have

KNOWLEDGE:

- advanced knowledge of product development in global value chains with focus on sustainability
- advanced knowledge of innovation processes in global value chains

SKILLS:

- ability to analyze and choose development methodology for sustainability in industry and market

GENERAL COMPETENCE:

- ability to evaluate scientific ethical implications of sustainable product development
- advanced understanding of innovation processes in general

Emnets temaer:

Product and process development:

- Product planning in an internal resource perspective
- Analyzing customer need
- Product specification
- Concept development and testing
- Prototyping and robustness
- Rights and economy
- Design for X

Design for sustainability

- Design for environmental sustainability (life cycle, minimal use of resources, life cycle optimizing and disassembly / recycling)
- Methods and tools for environmental sustainability (life cycle analysis)
- Overview of research on sustainability

Pedagogiske metoder:

Forelesninger

Gruppearbeid

Pedagogiske metoder (fritekst):

The course will be made accessible for both campus- and remote students. Every student are free to choose the pedagogic arrangement form that are best fitted for her/his own requirement.

The lectures in the course will be given on campus and are open for both categories of students.

Lectures that sums up the main issues in the lecture will also be available on internet through GUC's learning management system (ClassFronter).

Tutoring are given at campus in accordance to announced times. In addition there will be at least on gathering at campus for remote students with mandatory laboratory exercises.

Tutoring is also available on internet.

Vurderingsformer:

Skriftlig eksamen, 4 timer

Vurderingsformer:

4 hours written exam

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

2 internal examiners

Utsatt eksamen (tidl. kontinuasjon):

Re-sit examination

Written exam may change into oral exam

Approved project essay is valid for 2 years

Tillatte hjelpemidler:**Obligatoriske arbeidskrav:**

One individual work

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Professor Stig Roland Ottoson

Læremidler:

Ottoson, S. (2013): Dynamic Product Development Principles, Tervix, Gothenburg (ISBN 978-91-977947-4-9)

Klar for publisering:

Ja

TØL4901 Master Thesis - 2013-2014

Emnekode:

TØL4901

Emnenavn:

Master Thesis

Faglig nivå:

Master (syklus 2)

Studiepoeng:

30

Varighet:

Vår

Språk:

Engelsk

Forutsetter bestått:

IMT4421 Scientific Methodology

TØL4081 Industry project.

70 ECTS of the master program courses must be passed before the approval of the master thesis

Forventet læringsutbytte:

The thesis will demonstrate the student's ability to define and complete a science project with the aim to produce new knowledge. The thesis will demonstrate the student's ability to:

Knowledge :

- choose relevant methods according to the problem definition
- carry out the project according the chosen methods
- discuss the results and draw defensible conclusions and make recommendations

Skills :

- clearly and independently define a significant problem relevant to the master's program
- arrange necessary studies or experiments

General competence:

- Are capable of acquiring new knowledge
- Are capable of presenting scientific work and results in oral form

Emnets temaer:

The student shall pick a specific problem of relevance to the master's program.

The topic must represent a challenge within the specific area and must require that the student adheres to practices that are common within the area.

The topic must be preapproved by the supervisor.

Pedagogiske metoder:

Annet

Pedagogiske metoder (fritekst):

The course will be made accessible for both campus- and remote students. Every student are free to choose the pedagogic arrangement form that are best fitted for her/his own requirement.

The lectures in the course will be given on campus and are open for both categories of students. Lectures that sums up the main issues in the lecture will also be available on internet through GUC's learning management system (ClassFronter).

Tutoring are given at campus in accordance to announced times. In addition there will be at least on gathering at campus for remote students with mandatory laboratory exercises.

Tutoring is also available on internet.

Vurderingsformer:

Annet

Vurderingsformer:

Project rapport and oral presentation

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

The master thesis will have one internal and one external censor and one or two student opponent

Utsatt eksamen (tidl. kontinuasjon):

After failure (F), the student may submit a new or a revised thesis once. If the student chooses to submit a revised version of the thesis, this must be submitted in the following semester.

Tillatte hjelpemidler:**Obligatoriske arbeidskrav:**

The student must participate in the supervision as a supervisee. The student must present a project status report to the supervisor within 3 months and demonstrate that the project can be completed according to the current project plan or, alternatively, adjust the plan accordingly to ensure a successful outcome. The status report must be approved by the supervisor. The student is required to defend the master thesis in an oral presentation with one fellow student as opponent. The student is required to review the work of one fellow student and to present this review during the student's defense.

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Professor Stig Roland Ottoson

Klar for publisering:

Ja

TØL4003 Philosophies of social science - 2013-2014

Emnekode:

TØL4003

Emnenavn:

Philosophies of social science

Faglig nivå:

Master (syklus 2)

Studiepoeng:

5

Varighet:

Høst

Språk:

Engelsk

Forventet læringsutbytte:

Se engelsk versjon

Emnets temaer:

Se engelsk versjon

Pedagogiske metoder:

Essay

Forelesninger

Nettbasert Læring

Prosjektarbeid

Veiledning

Pedagogiske metoder (fritekst):

Se engelsk versjon

Vurderingsformer:

Annet

Vurderingsformer:

Se engelsk versjon

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

Se engelsk versjon

Utsatt eksamen (tidl. kontinuasjon):

Se engelsk versjon

Tillatte hjelpemidler:

Tillatte hjelpemidler (gjelder kun skriftlig eksamen):

Se engelsk versjon

Obligatoriske arbeidskrav:

Se engelsk versjon

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Professor Hans Christian Garmann Johnsen

Læremidler:

Se engelsk versjon

Erstatter:

TØL4002

Klar for publisering:

Ja

TØL4021 Management and Leadership for Sustainability - 2013-2014

Emnekode:

TØL4021

Emnenavn:

Management and Leadership for Sustainability

Faglig nivå:

Master (syklus 2)

Studiepoeng:

10

Varighet:

Høst

Språk:

Engelsk

Anbefalt forkunnskap:

Se engelsk versjon

Forventet læringsutbytte:

Se engelsk versjon

Emnets temaer:

Se engelsk versjon

Pedagogiske metoder:

Forelesninger

Gruppearbeid

Pedagogiske metoder (fritekst):

Se engelsk versjon

Vurderingsformer:

Annet

Vurderingsformer:

Se engelsk versjon

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

Se engelsk versjon

Utsatt eksamen (tidl. kontinuasjon):

Se engelsk versjon

Tillatte hjelpemidler:**Tillatte hjelpemidler (gjelder kun skriftlig eksamen):**

Se engelsk versjon

Obligatoriske arbeidskrav:

Se engelsk versjon

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Professor Tom Johnstad

Læremidler:

Se engelsk versjon

Klar for publisering:

Ja

TØL4031 Quality and Risk Management - 2013-2014

Emnekode:

TØL4031

Emnenavn:

Quality and Risk Management

Faglig nivå:

Master (syklus 2)

Studiepoeng:

10

Varighet:

Vår

Språk:

Engelsk

Anbefalt forkunnskap:

Se engelsk versjon

Forventet læringsutbytte:

Se engelsk versjon

Emnets temaer:

Se engelsk versjon

Pedagogiske metoder:

Gruppearbeid

Veiledning

Pedagogiske metoder (fritekst):

Se engelsk versjon

Vurderingsformer:

Annet

Vurderingsformer:

Se engelsk versjon

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

Se engelsk versjon

Utsatt eksamen (tidl. kontinuasjon):

Se engelsk versjon

Tillatte hjelpemidler:

Tillatte hjelpemidler (gjelder kun skriftlig eksamen):

Se engelsk versjon

Obligatoriske arbeidskrav:

Se engelsk versjon

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Associate Professor Rhythm Suren Wadhwa

Læremidler:

Se engelsk versjon

Klar for publisering:

Ja

TØL4151 Life Cycle Assessment - 2014-2015

Emnekode:

TØL4151

Emnenavn:

Life Cycle Assessment

Faglig nivå:

Master (syklus 2)

Studiepoeng:

5

Varighet:

Vår

Språk:

Engelsk

Forventet læringsutbytte:

se engelsk versjon

Emnets temaer:

se engelsk versjon

Pedagogiske metoder:

Forelesninger

Gruppearbeid

Veiledning

Pedagogiske metoder (fritekst):

se engelsk versjon

Vurderingsformer:

Hjemmeeksamen, 12 timer

Muntlig, individuelt

Vurderingsformer:

se engelsk versjon

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

se engelsk versjon

Utsatt eksamen (tidl. kontinuasjon):

se engelsk versjon

Tillatte hjelpemidler:

Tillatte hjelpemidler (gjelder kun skriftlig eksamen):
se engelsk versjon

Obligatoriske arbeidskrav:
se engelsk versjon

Ansvarlig avdeling:
Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:
Associate professor Guri Krigsvoll

Læremidler:
se engelsk versjon

Klar for publisering:
Ja

TØL4161 Sustainable Products Innovations - 2014-2015

Emnekode:

TØL4161

Emnenavn:

Sustainable Products Innovations

Faglig nivå:

Master (syklus 2)

Studiepoeng:

5

Varighet:

Vår

Språk:

Engelsk

Anbefalt forkunnskap:

TØL4041 Sustainable development

Forventet læringsutbytte:

After completing the course, the student is supposed to have

KNOWLEDGE:

- advanced knowledge of product development in global value chains with focus on sustainability
- advanced knowledge of innovation processes in global value chains

SKILLS:

- ability to analyze and choose development methodology for sustainability in industry and market

GENERAL COMPETENCE:

- ability to evaluate scientific ethical implications of sustainable product development
- advanced understanding of innovation processes in general

Emnets temaer:

Product and process development:

- Product planning in an internal resource perspective
- Analyzing customer need
- Product specification
- Concept development and testing
- Prototyping and robustness
- Rights and economy
- Design for X

Design for sustainability

- Design for environmental sustainability (life cycle, minimal use of resources, life cycle optimizing and disassembly / recycling)
- Methods and tools for environmental sustainability (life cycle analysis)
- Overview of research on sustainability

Pedagogiske metoder:

Forelesninger

Gruppearbeid

Pedagogiske metoder (fritekst):

The course will be made accessible for both campus- and remote students. Every student are free to choose the pedagogic arrangement form that are best fitted for her/his own requirement.

The lectures in the course will be given on campus and are open for both categories of students.

Lectures that sums up the main issues in the lecture will also be available on internet through GUC's learning management system (ClassFronter).

Tutoring are given at campus in accordance to announced times. In addition there will be at least on gathering at campus for remote students with mandatory laboratory exercises.

Tutoring is also available on internet.

Vurderingsformer:

Skriftlig eksamen, 4 timer

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

2 internal examiners

Utsatt eksamen (tidl. kontinuasjon):

Re-sit examination

Written exam may change into oral exam

Approved project essay is valid for 2 years

Tillatte hjelpemidler:

Obligatoriske arbeidskrav:

One individual work

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig kobling:

[Stig Roland Ottoson](#)

Emneansvarlig:

Professor Stig Roland Ottoson

Læremidler:

Ottoson, S. (2013): Dynamic Product Development Principles, Tervix, Gothenburg (ISBN 978-91-977947-4-9)

Klar for publisering:

Ja

TØL4051 Information Systems Strategy - 2014-2015

Emnekode:

TØL4051

Emnenavn:

Information Systems Strategy

Faglig nivå:

Master (syklus 2)

Studiepoeng:

10

Varighet:

Vår

Språk:

Engelsk

Anbefalt forkunnskap:

Se engelsk versjon

Forventet læringsutbytte:

Se engelsk versjon

Emnets temaer:

Se engelsk versjon

Pedagogiske metoder:

Annet

Pedagogiske metoder (fritekst):

Se engelsk versjon

Vurderingsformer:

Annet

Vurderingsformer:

Se engelsk versjon

Karakterskala:

Bokstavkarakterer, A (best) - F (ikke bestått)

Sensorordning:

Se engelsk versjon

Utsatt eksamen (tidl. kontinuasjon):

Se engelsk versjon

Tillatte hjelpemidler:

Obligatoriske arbeidskrav:

Se engelsk versjon

Ansvarlig avdeling:

Avdeling for teknologi, økonomi og ledelse

Emneansvarlig:

Professor Kristian Martinsen

Læremidler:

Se engelsk versjon

Klar for publisering:

Ja