

The Department of Forest and Wood Technology

At the moment a distinctive research endeavour is carried out in the area of Forest and Wood Technology. Education and research is directed in four areas.

1. The forest
2. Wood as material
3. Construction and manufacturing
4. Economics/market and trade

Research together with education forms Växjö University to a Wood technological centre that is a gathering position for research, industry and the general public in tasks regarding the forest-, wood- and construction industry.

The region around Växjö is one of Europe's most important areas concerning forestry and forest industry. Forest and Wood technology at Växjö University works with a wide scientific area. Including the whole chain from forest to manufactured products and the development of new wood products for construction and interiors.

A Living Campus

In Växjö an early decision was made to invest in a campus more along American lines. The then university college was built just outside the city centre, in a location that offered plenty of room for expansion.

Today, as a result, Växjö University boasts Sweden's most complete campus. The 14,000 Växjö students have all the amenities necessary for a comfortable life. Modern housing, beautiful study halls, nature, entertainment – all within walking distance.

Everything close at hand

Teaching premises and accommodation stand side by side on the campus. There are also restaurants, cafés, bars, bookshops, a sports centre and a variety of service facilities. And for students needing a break from their studies there are various opportunities to engage in serious or more light-hearted leisure activities. The Videum Science Park, tasked with looking after and developing the intellectual capital in and around Växjö University, is also integrated into the site.

Green environment

The campus offers a safe, relaxed environment despite the high level of activity. It is bordered by green meadows, a nature conservation area, a lake with a bird-watching tower and a castle. New buildings have been erected with due concern for the surroundings, which means that you will still see old trees and moss-covered boulders among

the new architecture on campus. Cars have only limited access to the site, but cycle paths lead directly to the town centre and out into the beautiful countryside all around.

School of Technology and Design

Courses in English 2007/2008

Bioenergy Technology
Forest and Wood Engineering
Glass Chemistry and Technology
Mechanical Engineering
Terotechnology (TQMain)



Växjö
University

School of Technology and Design

June 2007

Introduction

The School of Technology and Design at Växjö University

The School consists of 7 departments and the administration. We are about 120 people employed and educate 700 full-time students per year. The research is carried out with close collaboration with companies in southern Sweden. The School of Technology and Design is located on the Campus and the main part of our activities take place in the largest modern wooden house in northern Europe. 11 400 square meters, the “M-house”, or “Trähuset” as it is called in Swedish.

Admission

The admission of international exchange students is open to qualified students who are recommended by their home university on an exchange basis. This means that the exchange student pays his or her tuition at the home university and pays room and board at Växjö University.

Applications should be made through the home university and sent to Växjö University's International Office (see address at the end of this publication) no later than May 1st for autumn semester and no later than October 1st for the spring semester.

For students applying after these dates, university accommodation cannot be guaranteed.

Note! The study options and application procedure differ depending on whether you are an exchange student or non-exchange student. Non-exchange students always apply through the Admission Office at Växjö University, while exchange students apply through the coordinator at his/her home university. Also note that Växjö University does not use the services of agents in foreign countries to recruit students. Non-exchange students are to apply on their own directly to the university.

Examination and grades

Examination takes place after each single subject course. A student who fails an examination is given the opportunity to retake the examination at a later date. Only successfully completed courses are recorded on the student's transcript. The transcription will not show if you have failed an examination. The School of Technology and Design is currently in the process of implementing ECTS grading for the exchange students. This work will be going on during 2007/2008. Credits transfer is to be coordinated prior to the exchange with the home university.

Swedish as a foreign language

Exchange students can choose courses in the Swedish language from beginners' level up to native-speakers' level. Students who want to learn some Swedish along their regular studies can sign up for a non-credit introductory class in Swedish. Please see the web page http://www.vxu.se/english/exchange_students/exchange/guide/language_course.html for further details or contact the International Office at Växjö University.

Courses

The single subject courses contained in this guide are divided into autumn and spring semesters according to when they are offered. They are also divided in basic and advanced level.

In order to study full time at the School of Technology and Design you should apply for 30 Swedish credit points per semester. 1,5 Swedish credit point represents one week of successfully completed full-time studies or approximately 0,75 American semester credits or 1,5 ECTS. 60 ECTS represent the workload of one year's full-time study.

Suggestions about the selection of the courses

As you can see in this brochure, TD offers a great variety of courses in English. When choosing the ones that fit your study plan, you will have to take into consideration many factors and variables.

Each semester consists of 30 Swedish credits point (30 ECTS).

Generally the semester is divided as follows:

Fall semester:	End of August	End of October	Middle of January
Spring semester:	End of January	End of March	Beginning of June
	Course 1 (7,5 ECTS)	Course 3 (7,5 ECTS)	
	Course 2 (7,5 ECTS)	Course 4 (7,5 ECTS)	

or, if you want to carry out a degree project:

Spring semester:	End of January	End of March	Beginning of June
	Course 1 (7,5 ECTS)	Degree project (15 ECTS)	
	Course 2 (7,5 ECTS)		

This means that you will be asked to choose 2 courses for the first half and 2 for the second half (one if you carry out a degree project during the spring semester). The periods are clearly indicated in the course descriptions.

Full-semester courses/full-year courses

You can even apply for comprehensive “packages”.

Full-semester courses consist of a full-time semester study (20 weeks) with a curriculum consisting of several modules. The full-year courses consist of a full-time year study (40 weeks) with a curriculum consisting of several modules divided into fall and spring semester.

If you choose to apply for a full-semester or a full-year course you have to follow all the modules making up the curriculum. Full semester courses are only combinable with single subject courses if the course is studied in addition to the full-semester curriculum. **Students attending the full-semester or the full-year courses will get a certificate for their studies only when they will have completed the whole curriculum.**

The full-year courses at the School of Technology and Design are organized in a way that will allow the attending students to get a Swedish degree, whereas the student fully meets the requirements for obtaining a degree. Note! Individual assessment for every case will be performed

Choosing a full-semester course will also avoid course schedules' conflict.

Full-year courses

Full-year course in Total Quality Maintenance

Course code UB9013

Fall semester

SE9983 Maintenance Technology	SE9953 Technical life cycle cost/profit
SE9973 Condition Monitoring Technology or SE9053 Six Sigma	SE9963 Integrated Case Study

Spring semester

SE9932 Facilities Planning and Production Planning	SE9873 Thesis (Bachelor)
JE9013 Management in Manufacturing Industries	

Pre-requisites

7,5 Swedish credit points (7,5 ECTS) Logistics
 7,5 Swedish credit points (7,5 ECTS) Economics
 7,5 Swedish credit points (7,5 ECTS) in Industrial measurements and failure analysis
 22,5 Swedish credit points (22,5 ECTS) in mathematics
 15 Swedish credits points (10 ECTS) in mathematical statistics
 7,5 Swedish credit points (7,5 ECTS) in Maintenance/logistics
 7,5 Swedish credit points (7,5 ECTS) in Quality management

If you want to apply for a Swedish degree (180 Swedish credit points, 180 ECTS), you need to have 120 Swedish credit points (120 ECTS) before you begin your studies at Växjö University. It means that you need 47,5 Swedish credit points (47,5 ECTS) in addition to the above mentioned pre-requisites.

Note! Individual assessment for every case will be performed

Full-year course in Engineering Management

Course code UB9103

Fall semester

MT9513 Facilities Planning	MT9013 Operations Management
MT9523 Life Cycle Cost Analysis	SE9991 Technical projects and report Writing

Spring Semester

JE9013 Management in Manufacturing Industries	MT9903 Thesis
SE9913 Quality Technology, or	
MT9322 Machine Design I, or	
MT9221 Industrial Design I	

Pre-requisites

120 ECTS within the subject “Mechanical or Industrial Engineering”, or equivalent.

Note! Individual assessment for every case will be performed

Full-semester courses

Full-semester course in Engineering management

Course code UB9113

Spring Semester

JE9013 Management in Manufacturing Industries	MT9903 Thesis
SE9913 Quality Technology, or	
MT9322 Machine Design I, or	
MT9221 Industrial Design I	

Pre-requisites

150 ECTS within the subject “Mechanical or Industrial Engineering”, or equivalent.

Note! Individual assessment for every case will be performed

Single subject courses

Fall semester – Basic level

Bioenergy Technology

Contact Person Björn Zethräus
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School of Technology and Design

BT9801 Bioenergy Technology

September–December, 2007

Level: B1

7.5 Swedish credit points

Part-time

The course presents the fundamental aspects of the technology for using biofuels in the energy system. Global considerations, biological constraints, fuel supply systems, fuel quality and combustion technology are treated.

After this course the participants will have gained an understanding of the basic differences between a biofuel-based and a fossil-fuel-based energy system.

Contents

What are the resources of biofuel from a global point of view? Why is a change of the energy system needed to promote a sustainable development? What constraints restrict the use of bioenergy in a global as well as in a local perspective? How can the fuel quality be improved? How can a secure supply of fuel be guaranteed and what are the environmental aspects of the supply system? How does combustion equipment react to these fuels? The course is fully Internet-based and all instructions are in English.

Prerequisites

Basic eligibility and a good command of English.

Recommended reading

The course literature is a compendium specially written for the course.

Assessment methods

To pass the course you will have to be an

active participant in the discussions concerning all chapters and you will have to complete the three individual exercises distributed with the course material and mail them to the teacher. If you do not take part in the discussions or do not solve your exercises your password to FirstClass® will be withdrawn.

This is equivalent to locking you out of the virtual classroom and you will no longer have access either to the literature or to the teacher. Therefore, time- and space-independence do not mean that there are no demands put on you as a student.

Notice! This is a distance-learning course – fully web-based. Details on hardware and software requirements can be obtained from micael.carlsson@vxu.se.

MV9201 Environmental Understanding in an International Perspective

September–December, 2007

Level: B1

7.5 Swedish credit points

Part-time

Contents

This is a basic course giving the student a good understanding, from an EU perspective, of the cause and effect of the environmental problems of today. The course also includes parts dealing with what society does and what you yourself can do to achieve a better environment.

All »lectures« are given via the Internet.

Each chapter contains a self-test section with diagnostic questions. There will also be one major individual exercise, the solution of which is to be e-mailed to the teacher, and in

addition you are requested to pick one more exercise by yourself. Both exercises are to be reported in English in the form of short reports. Teacher support is available "in private" via e-mail and "in plenum" via the course conference site.

The course is fully Internet-based and all instructions are in English.

Prerequisites

Basic eligibility and a good command of English.

Assessment methods

There will be two exercises in the course, one is pre-defined, but you will have to define the second one together with the main teacher. To pass you will have to complete the exercises. Therefore, time- and space-independence do not mean that there are no demands put on you as a student.

Notice! This is a distance-learning course – fully web-based. Details on hardware and software requirements can be obtained from micael.carlsson@vxu.se.

Forest and wood engineering

TS9101 Science of Forestry

Contact Person Göran Peterson

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Telephone: +46 470 70 88 25

School of Technology and Design

August–October, 2007

Level: B1

7.5 Swedish credit points

Part-time

Contents

The aim is to give the student a broad introduction to Swedish forestry.

The course includes the following areas:

- Swedish forests and forestry in figures
- Silviculture
- Forest management
- Nature conservation
- Excursions
- Small project work

Prerequisites

One year of university studies (equal to 60 Swedish credit points) and a good command in English.

Recommended reading

Greener Forests (208 pp), National Board of Forestry.

Teaching methods

Teaching methods include lectures, seminars and excursions.

Assessment methods

The examination is based on a written or oral test concluding the course. Additional

opportunities will be given to students who do not pass the examination successfully. A further requirement is an individual project work.

TS9333 Forest Industry Markets

Contact Person Anders Baudin

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School of Technology and Design

November 2007–January 2008

Level: B3

7.5 Swedish credit points

Part-time

Contents

The aim is to give the student knowledge of the global markets for forest products as well as patterns of marketing and trading in the Scandinavian forest industry.

The course includes the following areas:

Forest resources and Industry in a global perspective

The Swedish forest sector and its international competitiveness

Market analysis

The marketing of forest products

Prerequisites

One year of university studies within Forest and Wood Engineering (equal to 60 Swedish credit points) and a good command in English.

Recommended reading

Juslin, H. Hansen, E. 2002, Strategic Marketing in the Global Forest Industries, Authors Academic Press.

Teaching methods

Teaching methods include lectures, seminars and individual tutorials. The teaching also includes project work in contact with industry.

Assessment methods

The examination is based partly on the project work and partly on the written or oral test concluding the course. Additional

opportunities will be given to students who do not pass the examination successfully.

Mechanical engineering

MT9013 Operations Management

Contact Person Imad Alsyouf

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School of Technology and Design/Mechanical Engineering Department

Beginning of Nov- end of Dec 2007.

Level: B3

7.5 Swedish credit points

Part-time (50%)

Contents

The course consists of the following elements:

- The role of Production management in the logistics system.
- Material planning and control; techniques and methods for planning/control of material flows in different planning horizons and production environments. Methods with particular focus are master production scheduling, order planning and operations planning.
- Methods for lot sizing.
- Procurements: supplier(s) selection-evaluation.
- Distribution and transportation systems

Prerequisites

MT9513 (Facilities planning), or equivalent

Teaching methods

Teaching consists mainly of lectures, group-work, seminars, and exercises. Cases (project works), guest lectures and field visits could also be part of the course. Participating in case-seminars, field visits and guest lectures are compulsory

Assessment methods

The students' performance can be evaluated through assignments, small written exam(s), seminars, written reports of project work (case studies), presentation and opposition

and written and/or oral exam of the compulsory work. One is required to pass on all parts.

Required reading

Nahmias, Steven. Production and Operations Analysis, McGraw-Hill, Latest edition

(About 500 pages)

Relevant articles

MT9451 Product Development I

Contact Person Samir Khoshaba

E-mail: samir.khoshaba@vxu.se

Telephone: +46 470 70 88 15

School of Technology and Design

Beginning of September–end of October 2007

Level: B1

7.5 Swedish credit points

Part-time

Contents

The course contains the following parts:
the meaning of the product development process

the product planning period
requirements list and specification booklet

systematic approach, functional analysis
creativity, generating new ideas

the evaluation procedure

basic principles of embodiment design

design for safety

During the whole period the students work on a definite subject. They use the methods of the

course step by step and have to deliver a

written file that documents their work

(specifications, sketches, drawings,

calculations etc.).

Prerequisites

At least 3 semesters studies (equal to 90 Swedish credit points) in an Engineering, Technology, Design programme, or in

programmes with mixed courses of Technology and Economics.

Teaching methods

The teaching consists of lectures, seminars and team-work experience. Some of the course parts require compulsory attendance at the lectures/seminars. There will be information about the extent of the compulsory parts at the beginning of the course.

Assessment methods

The examination will be based on written project reports. One report per group.

MT9463 Machine Design II

Contact Person Samir Khoshaba

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Telephone: +46 470 70 88 15

School of Technology and Design

Beginning of November–end of December 2007

Level: B3

7.5 Swedish credit points

Part-time

Contents

The course contents are:

- Calculation and design of gears and gear transmissions
- Design and selection belt and roller chain transmissions and its parts.
- Calculation and design of shafts and shaft related parts including shrink joints
- Calculation and selection of roller-element bearings and seals
- Practicing in using Swedish standards and product catalogues
- Applying of design work
- Training in generating of assembly and detail drawings
- Design Project.

Prerequisites

The students must have completed courses in Engineering Mathematics, Technical Drawing, CAD, Mechanics, Solid Mechanics (strength of material) and Material Sciences and basic course of machine design

Teaching methods

The teaching include lectures, seminars and group work time. The students are required to work in groups in order to design one gearbox per group. The theoretical part of the course will give the students enough know-how to dimension and design a gearbox per group.

Assessment methods

The examination will be based on the design project report and homework. Also a written exam may be accomplished.

MT9513 Facilities Planning

Contact Person Imad Alsyouf

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Telephone: +46470708494

School of Technology and Design

Beginning of September- end of October 2007.

Level: B3

7.5 Swedish credit points

Part-time(50%)

Contents

The course consists of the following elements:

- Strategic facilities planning
- Product, process, and schedule design
- Flow, space and activity relationships
- Personnel requirements
- Material handling systems
- Layout planning models and design algorithms
- Developing alternatives facilities plans.
- Evaluating and selecting the facilities plan.

Prerequisites

Two-year study in MTBP, Engineering, Business, or equivalent program.

Teaching methods

Teaching consists of lectures, group-work, laboratory work, submitted assignments, seminars and case studies (projects).

Assessment methods

The students' performance can be evaluated through assignments, small written exam(s), seminars, written reports of project work (case studies), presentation and opposition and written and/or oral exam of the compulsory work.

Required reading

Facilities Planning, latest edition, Tompkins James, White John, Bozer Yavuz, Tanchoco J. (about 600 pages)
Relevant articles

MT9523 Life Cycle Cost Analysis

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Telephone: +46470708494

School of Technology and Design/Mechanical

Engineering Department

Beginning of September- end of October 2007.

Level: B3

7.5 Swedish credit points

Part-time(50%)

Contents

The course consists of the following elements:

- LCC Methodology
- Cost concepts
- Cost estimation techniques
- Money-Time relationships and equivalence
- Multiple criteria decision making (MCDM)

Prerequisites

Two-year study in MTBP, Engineering, Business, or equivalent program.

Teaching methods

Teaching consists of lectures, group-work, laboratory work, submitted assignments, seminars and case studies (projects).

Assessment methods

The students' performance can be evaluated through assignments, small written exam(s), seminars, written reports of project work (case studies), presentation and opposition and written and/or oral exam of the compulsory work.

Required reading

Facilities Planning, latest edition, Tompkins James, White John, Bozer Yavuz, Tanchoco J. (about 600 pages)

Relevant articles

Terotechnology

Contact Person Elena Vinci Hytter

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School of Technology and Design

SE9991 Technical Project Management and Report Writing

October, 2007–January, 2008

Level: B1

7.5 Swedish credit points

Part-time

The purpose of the course is to give the students knowledge of the planning, accomplishment and debriefing of technical projects.

Contents

The course covers the following elements:

- project-planning, project accomplishment and economy
- scientific report-writing, e.g. setting up a report, the logical flow of text, figures and tables, etc.
- choosing sources of information
- technical report writing
- the technique of oral presentation
- national and international rules for technical report-writing

Prerequisites

Completed upper secondary education and a good command of English.

Recommended reading

Kerzner, Harold, *Project Management, a Systems Approach to Planning, Scheduling and Controlling*, 8th ed. Wiley, 2002. Day, R. A., *How to Write & Publish a Scientific Paper*, 5th ed, Cambridge University Press, 1988.

Teaching methods

The teaching consists of lectures, seminars, exercises, project work and report-writing. Participation in exercises and a company-located case study are obligatory.

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9001 Business-Driven Quality Maintenance

September – October 2007
Level: B1
7.5 Swedish credit points
Part-time

The main objectives of this course are to provide students with an introductory knowledge of and practical experience in terminology, methods and applications in quality, reliability, maintenance, durability, logistics and life cycle costs and profits. Another objective of the course is to demonstrate how these working areas are integrated and the synergy effects of such integration on a company's profit.

Contents

The course consists of a description of the terminology, methods and applications of Total Quality Management (TQM), reliability analysis, maintenance, durability, logistics, quality control, life-cycle cost/profit and the integration of these subjects. There is also a real on-site case study, which integrates these disciplines.

Prerequisites

Basic eligibility and a good command of English.

Recommended reading

B. Bergman, B Klefsjö, *Quality from Customer Needs to Customer Satisfaction*, Studentlitteratur Lund 1995 (also available in Swedish). Martin Christopher: *Logistics and Supply Chain Management Strategies for Reducing Cost and Improving Service*, Prentice Hall, 1998.

Teaching methods

The course consists of lectures, exercises, laboratory exercises and report-writing.

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9992 Computerised information handling for industrial systems

September – October 2007
Level: B2
7.5 Swedish credit points (7.5 ECTS)
Part-time

The purpose of the course is to give students:

- knowledge about how data and information is handled in databases and other computerised systems
- basic knowledge about relational algebra and SQL
- knowledge about how data is protected in storage, processing and transaction stressing the specific problems concerning manufacturing companies
- deeper knowledge about database architectures and their use in manufacturing companies.

Contents

The course covers the following elements:

- physical database design
- relational algebra
- SQL
- data security generally and within manufacturing companies
- database architecture and its use within manufacturing companies.

Prerequisites

Equal to SEA923 (7.5 Swedish credit points within databases and data modelling).

Recommended reading

Hoffer J. Prescott M. McFadden F. R., *Modern Database Management*, 6 ed. Prentice Hall 2002. Beginners book in Access, recommended titles: Hallberg, Jan, *Microsoft Access 2000*. Everö, Olle, *Access 2000*.

Teaching methods

Lectures, seminars, laboratory work and case studies.

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9973 Condition Monitoring Technology

September – October 2007

Level: B3

7.5 Swedish credit points

Part-time

The purpose of the course is to give the students:

- a basic knowledge of theory and methods used in condition monitoring in complex and small systems
- a knowledge of the technical and economic effects of condition-monitoring on both machines and production processes
- knowledge of the role of condition-monitoring in maintenance and production-planning and also in the profitability of the company
- a knowledge of the role condition-monitoring has in the improvement of quality control.

Contents

The course covers the following elements:

- methods used in condition-monitoring
- technical measuring
- qualitative and quantitative methods for analysis
- economic results
- the integration of condition monitoring, production and quality control and the benefit of this as a tool for securing quality
- case studies
- a project around real industrial problems.

Prerequisites

Admission to the course requires 7.5 Swedish credit points in business economics and quality, 15 Swedish credit points in mathematics, 7.5 Swedish credit points in statistics, a knowledge of/experience in industrial measurement and failure analysis (equal to SEB911, or a knowledge of/experience in maintenance technology), or the equivalent.

Recommended reading

Basim Al-Najjar, *Condition Monitoring and Condition Based Maintenance*.

Teaching methods

The teaching consists of lectures, seminars, laboratory work, case studies (projects) and educational visits. Participation in seminars,

laboratory work and practical work is obligatory.

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9983 Maintenance Technology

September – October 2007

Level: B3

7.5 Swedish credit points

Part-time

The purpose of the course is to give the student:

- some knowledge of maintenance strategies, methods and philosophies
- a knowledge of the economic influence of maintenance work on different systems for production
- a basic knowledge of theories and methods used in technical maintenance management in complex and smaller systems.

Contents

The course covers the following elements:

- reliability and maintenance management
- product safety
- maintenance approaches, i.e. corrective, preventive, condition-based, reliability-centred maintenance, total productive maintenance, total quality maintenance
- maintenance organisation
- the economic implication of maintenance
- case studies (projects) on real industrial problems
- the decision process
- maintenance audit and IT.

Prerequisites

Admission to the course requires, besides completed upper secondary education and a good command of English, knowledge of industrial measurement and failure analysis, knowledge of quality and business economics (equal to JEA900), or the equivalent.

Teaching methods

The teaching consists of lectures, seminars, exercises and essay-writing. Participation in seminars and practical work is obligatory.

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9963 Industrial Integrated Case Study

November 2007 – January 2008

Level: B3

7.5 Swedish credit points

Part-time

The purpose of the course is:

- to make the student familiar with the meaning of integration among different fields such as quality, production, maintenance, logistics and economy
- to give some understanding of relevant concepts, tools and methods used for integration among these fields
- to give an understanding of how these concepts, tools and methods may be used to show the role of maintenance in company economy
- to give the student theoretical and practical knowledge, experience and ability to design and carry out development work in one of the fields mentioned above in a holistic way.

Contents

The course covers the following elements:

- integration in producing companies
- co-operation among different fields in producing companies
- methods used to analyse the company's operation
- a systematic way to calculate the economic influence of maintenance on quality, production, the value of spare parts, insurance, etc
- an exposition of the benefit a company can gain from such a systematic way of working and how it can be accomplished.

Prerequisites

Admission to the course requires, besides completed upper secondary education and a good command of English, knowledge of industrial measurement and failure analysis, knowledge of quality and business economics, knowledge of/experience in maintenance technique and logistics (equal to SEC918 and SEC914), or the equivalent.

Recommended reading

Basim Al-Najjar et al., *Economic Importance of Maintenance Planning when Using Vibration-based Maintenance Policy*.

Teaching methods

The teaching consists of lectures, submitted assignments, case studies (projects) on a producing company and a presentation of the project.

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9953 Technical Life Cycle Cost/Profit

October 2007 – January 2008

Level: B3

7.5 Swedish credit points

Part-time

The purpose of the course is:

- to make the students familiar with the meaning of LCC/LCP in technical plants
- to give the students some understanding of relevant concepts, methods and tools used in LCC/LCP in connection with the role of maintenance in the economy of the company
- to give some understanding of how LCC/LCP factors may be used to monitor the operation with regard to cost effectiveness during development, measuring, follow-up and analyses in order to reach cost effectiveness.

Contents

The course covers the following elements:

- a detailed description of the general LCC/LCP model and its applications in technical plants
- methods used in analyses
- a systematic way of calculating the economic effects of maintenance on quality, production, the value of spare parts, insurance, etc
- an exposition of the benefit a company can gain from such a systematic way of working and how it can be accomplished.

Prerequisites

Admission to the course requires, besides completed upper secondary education and a

good command of English, knowledge of industrial measurement and failure analysis, knowledge of quality and business economics.

Recommended reading

Dhillon, B.S., *Life Cycle Costing*, Gordon and Breach Science Publisher, 1989. Basim Al-Najjar et al., *Economic Importance of Maintenance Planning when Using Vibration-based Maintenance Policy*.

Teaching methods

The teaching consists of lectures, group work, laboratory work, submitted assignments and case studies (projects).

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9053 Six Sigma

September – October 2007

Level: B3

7.5 Swedish credit points

Part-time

The purpose of the course is to give the students:

- the background to Six Sigma
- a knowledge of the main features of Six Sigma
- a knowledge of how Six Sigma is related to other techniques/policies/strategies and how it is possible to use them together: advantages and disadvantages
- a knowledge about how Six Sigma works in practice.

Contents

The course covers the following elements:

- methods in feature analysis, for example QFD (Quality Function Deployment)
- the structure of Six Sigma
- the seven quality tools
- flowcharts
- systems for measuring and gathering data
- experiment design, factorial experiments
- a real case.

Prerequisites

Admission to the course requires 7.5 Swedish credit points in Business Economics, 15 Swedish credit points in Mathematics, 7.5 Swedish credit points in Statistics and 7.5

Swedish credit points in Quality Management, or the equivalent.

Recommended reading

Magnusson Kjell, Kroslid Dag, Bergman Bo, *Six Sigma, The Pragmatic Approach*.

Teaching methods

The teaching consists of lectures, group work, laboratory work, submitted assignments and case studies (projects).

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9993 Procurement, Distribution and Operations Research

September – October 2007

Level: B3

7.5 Swedish credit points

Part-time

The purpose of the course is to give the students the basic knowledge of operations research (linear programming) that enables the students to deal with optimisation problems in the area of supply chain management.

Contents

The course covers the following elements:

Part one: theory of Procurement and Distribution such as forecasting, aggregate planning, inventory control and logistic network design (Networking).

Part two: Supply chain management and operations research such as introduction to operations research, problem formulation, graphical solutions, the simplex method, applying linear programming software in supply chain management and the analysis of software outputs.

Prerequisites

Admission to the course requires besides basic qualification knowledge in logistics (equal to SEA915), knowledge of business economics (equal to JEA900), 15 Swedish credit points in mathematics, or the equivalent.

Recommended reading

Cole, I. J., Bardi, E. J., Langley Jr, C. J. *The Management of Business Logistics*, 6th ed, Publisher: West Publishing Company.

Teaching methods

The teaching consists of lectures, group work, laboratory work, submitted assignments and case studies (projects).

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

Fall semester – Advanced level

Mechanical engineering

MT9814 The Finite Element Method

Contact Person Elena Vinci Hytter

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Telephone: +46 470 70 81 53

School of Technology and Design

Beginning of November–end of December 2007

Level: A

7.5 Swedish credit points

Part-time

The course is given within Master programs in Building Technology, Mechanical Engineering and Wood Technology. The aim of the course is to provide the students with knowledge of the theory of the finite element method; weak and strong formulations, approximations and finite element formulations for different types of problem an understanding of and skill in implementing the method in a computer code to be able to perform simple analyses. the skill required for using a FEM program to perform different types of analyses

Contents

The course covers:

Strong and weak formulation of heat conduction and solid mechanics problems in

one or several dimensions, torsion and beam analysis.

Finite element formulations, basic functions – different approximations

Constitutive relations (relations between stress –strain and flow – temperature gradient etc.)

Principal stresses, different effective stress measures.

Numerical integration, mapping, isoparametric elements

Prerequisites

15 Swedish credit points in mathematics (Linear Algebra and Multidimensional Calculus from engineering programmes), 5 Swedish credit points in elementary solid mechanics, 5 Swedish credit points in structural mechanics at advanced level, or the equivalent.

Teaching methods

The teaching includes lectures, tutorials and computer exercises. The computer exercises (projects) are compulsory.

Assessment methods

The grading of the course is based on the results from the projects and from a written exam at the end of the course.

Spring semester – Basic level

Glass Chemistry and Technology

Contact Person Elena Vinci Hytter
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School of Technology and Design

KE9903 Field Studies/Project Work (in Glass Chemistry and Technology)

April–May, 2008
Level: B3
15 Swedish credit points
Full-time

Contents

The course is conducted as a project that will give the student training in individual literature surveys and summaries, individual theoretical and experimental work as well as writing reports and giving oral presentations. The project is to be found within the broad definition of glass chemistry and technology. All projects are individual and can either be independent or related to some other ongoing project work. The project topic can be related to interests gained from one's own studies or from university, to Växjö University interests, or to some industrial issue.

Prerequisites

Equal to KEC891 – Glass Chemistry and Technology.

Recommended reading

A specific literature survey/search will be made to define the state-of-the-art of the project topic.

Assessment methods

The written report on the project and the oral presentation will be assessed and the students will get feed-back on their contributions.

KE9913 Glass Chemistry and Technology

February–March 2008
Level: B3
15 Swedish credit points
Full-time

The course introduces the fundamentals of glass chemistry and technology for a wide range of products. It examines art and domestic glass, container glass, fiberglass, flat glass and high technology special glass. After having studied this course the participants will have gained an understanding of the basic concepts of glass engineering and technology, the nature of glass, and the processes, products and applications for several types of commercial glasses.

Contents

Definitions, glass transition. Range of chemical compositions, batch formulas and raw materials, products, processes and applications. Important processing properties, such as the viscosity-temperature relationship, crystallization and surface tension. Strength and mechanical properties. Annealing and stress measurement. Raw material specifications and batch mixing methods. Glass furnaces, glass melting and the manufacturing of commercial glass. Quality control and environmental issues.

Prerequisites

At least two years of university studies (equal to 120 Swedish credit points) in the fields of Metallurgy, Chemistry, Chemical or Mechanical Engineering.

Recommended reading

J.E. Shelby, *Introduction to Glass Science and Technology*, 2nd edition, Royal Society of Chemistry 2005; ISBN 0-85404-639-9

Assessment methods

The students will be given a written examination and are required to complete all exercises successfully. Notice! After completing this course the students may pursue further studies in the course KEC890 Field Studies/Project Work, 15 Swedish credit points.

Mechanical engineering

JE9013 Management in Manufacturing Industries

Contact Person: Tobias Schauerte
E-mail: tobias.Schauerte@vxu.se
Telephone: +46 470 70 8824
Period: end of January – end of March,
Level: B1
7.5 Swedish credit points
Part time studies (50%)

Purpose:

The purpose of this course is to learn about the different tasks of a management job.

Contents

Today's dynamic environment demands management skills that are important for every organisation. In this course, one of the first questions that need to be answered is: "What is management?" and "What do managers do?" The four classical management functions planning, organising, leading and controlling are corner stones in this course and will be covered on a general level. These four functions will be studied more in depth by addressing typical areas in each and one of them, like e.g. handling of communication and conflicts, planning and leading projects, Supply Chain Management or Total Quality Management.

The course is supported by online activities, where students have the possibility to use a learning package from the textbook author to do online-tests, self-assessments and much more to control their knowledge and prepare for the examination.

Teaching methods:

Lectures, group work, group presentations and seminars

Examination:

The students' performance can be evaluated through assignments, seminars, written reports of a project work (case studies), presentations and oppositions and written and/or oral exam of the compulsory work.

Course prerequisites

Basic university admission requirements

Required reading

Robbins, S.P. and Coulter, M. (2005).
Management, international edition (eighth

edition). Upper Saddle River, New Jersey: Pearson Education, Inc. (about 600 pages)
Relevant articles

MT9221 Industrial Design I

Contact Person Samir Khoshaba
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Telephone: +46 470 70 88 15
School of Technology and Design
End of January–end of March, 2008
Level: B1
7.5 Swedish credit points
Part-time

Contents

Design is everywhere. Design is a mirror and a characteristic feature of our time. *Almost* everything around us is manufactured and behind every manufactured product there is a person who has planned its look and function. A designer's work consists of transferring an often complicated technical and economic context to an attractive and functional form. This work is called the design process and during the course we study function analysis, value analysis, sketching, meta-values, colour, semiotics, identity, ergonomics, memory, perception etc. A consumer today has a multitude of products to choose from and design is an important factor in giving a product a competitive edge.

Prerequisites

Previous knowledge of and skills in drawing are required.

Assessment methods

The examination will be based on design projects plus homework/test.

MT9222 Industrial Design II

Contact Person Samir Khoshaba
E-mail: samir.khoshaba@vxu.se
Telephone: +46 470 70 88 15
School of Technology and Design
Beginning of April–beginning of June, 2008
Level: B2
7.5 Swedish credit points
Part-time

After finishing the course, the student will have:

- an in-depth knowledge of the design subject
- an in-depth knowledge of ergonomics
- a fundamental knowledge of how to present an idea
- a fundamental knowledge of Design Management

Contents

The course contains the following parts:

- in-depth knowledge of the design process
- sketch and drawing techniques
- design management
- design exercises and/design projects

Prerequisites

Basic eligibility and basic knowledge in technical drawing, basic knowledge about design process (function analyses and value analyses), basic knowledge about ergonomics.

Teaching methods

Lectures, projects, and laboratory exercises. It requires attendance of at least 80 % of the scheduled time.

Assessment methods

Examination can be written, oral and/or based on oral and written presentations of the tasks, projects etc

MT9322 Machine Design I

Contact Person Samir Khoshaba

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Telephone: +46 470 70 88 15

School of Technology and Design

End of January–end of March 2008

Level: B2

7.5 Swedish credit points

Part-time

Contents

The course contents are:

- Introduction to the subject of machine design
- Dimensioning and calculation with respect to failure, safety and reliability
- Dimensioning and calculations with respect to impact and fatigue loading, surface damage causes and weld joining.
- Dimensioning and selection of some screws and screw joints.

- Dimensioning and design with respect to force flow and stress concentration
- Calculation and dimensioning problems
- Design Project(s)

Prerequisites

The students must have completed courses in Engineering Mathematics, Technical Drawing, CAD, Mechanics, Solid Mechanics (strength of material) and Material Sciences.

Teaching methods

Teaching includes lectures, seminars, labs and group work (project). Some of the course parts require compulsory attendance at the lectures/seminars. Part of the course can be conducted in industry.

Assessment methods

The course examination will be based on a written exam in the end of the course, and written and oral presentation of a project result.

MT9473 Machine Design III

Contact Person Samir Khoshaba

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School of Technology and Design

Beginning of January–end of March 2008

Level: B3

7.5 Swedish credit points

Part-time

Contents

The course contents are:

- Calculation and design of sliding bearings
- Design and calculation of various springs.
- Calculation and design of brakes and clutches
- Basics in acoustics
- Design Project.

Prerequisites

The students must have completed courses in Engineering Mathematics, Technical Drawing, CAD, Mechanics, Solid Mechanics (strength of material) and Material Sciences and basic course of machine design

Teaching methods

The teaching include lectures, seminars and group work time. The students are required to work in groups in order to accomplish a design

project which will include theoretical and practical activities.

Assessment methods

The examination will be based on a written exam in the end of the course, and the result of the project.

MT9903 Thesis (in Mechanical Engineering, Bachelor level)

Contact Person Samir Khoshaba

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Telephone: +46 470 70 88 15

School of Technology and Design

End of March–end of May 2008

Level: B3

15 Swedish credit points

Full-time

Contents

The course contents are:

- To work independent, alone or in group of two students, in a project to solve one or some problems in mechanical products or systems.

- To apply knowledge from previous courses and search new knowledge and information to use for the problem solving.
- To present the project solutions by writing a scientific report
- To make an oral presentation in front of the supervisor and students.
- To act as opponent for a project group

Prerequisites

The students must have taken 15 Swedish credit point in the mathematic and at least 60 Swedish credit points in the subject of mechanical engineering.

Teaching methods

There are no lectures in this course, but it may be one or a couple of seminars. Otherwise it is an independent fulltime work for students. Almost all the projects in this course are from the local industry. It is the students responsibility to find a degree project for this course.

Assessment methods

The examination will be based on the written project report and the oral presentation.

Terotechnology

Contact Person Elena Vinci Hytter

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Telephone: +46 470 70 81 53

School of Technology and Design

SE9011 Industrial measurement and failure analysis

September – October 2007

Level: B1

7.5 Swedish credit points

Part-time

The purpose is to give the students:

- basic technical knowledge of machine elements (function, characteristics, production etc.), failure causes and measurement techniques.
- knowledge about tribology and deterioration processes, e.g wear, fretting and corrosion.

- failures and failure cause analysis
- measurement and control technology.

Prerequisites

Basic eligibility and a good command of English.

Recommended readings

Karlebo, Karlebo, *Handbok*, Liber Utbildning (senaste utgåvan). Hågeryd, Björklund, Lenner, *Modern produktionsteknik, del I*, Liber Utbildning. Callister, *Materials Science and Engineering*, John Wiley & Sons.

Teaching methods

The teaching consists of lectures, class-teaching, seminar practice, laboratory work, case studies (projects) and/or essay-writing on a practical subject. Participation in seminars and practical work is obligatory.

Contents

The course covers the following elements:

- machine elements
- processing techniques
- tribology and lubrication

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9031 Information Systems in Technological Environments

April – May 2008

Level: B1

7.5 Swedish credit points

Part-time

- The purpose is to give students:
- a fundamental knowledge of the concepts of data, information, information technology (IT) and information systems
- an understanding of the relations between information systems and industrial activities, stressing manufacturing processes

Contents

The course covers the following elements:

- the concept of information and surrounding concepts
- the general construction of an IT-system
- different information systems: construction and area of use
- information systems and industrial activities:
 - IT as a support to industrial processes
 - IT as a strategic tool
 - IT and the users
 - the IT organisation
 - IT security

Prerequisites

Basic eligibility and a good command of English.

Recommended reading

Reynolds, George W., *Information Systems for Managers*, Minneapolis/St. Paul West cop. 1995.

Teaching methods

Lectures, seminars, laboratory work and case studies.

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9913 Quality Technology

January – March 2008

Level: B3

7.5 Swedish credit points

Part-time

The purpose of the course is to give students:

- a knowledge of TQM and its application in complex and smaller systems
- a basic knowledge of theory and methods used in quality control and its economic importance to technical systems.

Contents

TQM

quality technology

qualitative and quantitative analysis methods

economic yield

practical examples

Prerequisites

Admission to the course requires 7,5 Swedish credit points in Business Economics, 22,5 Swedish credit points in Mathematics and 15 Swedish credit points in Mathematical Statistics or the equivalent.

Recommended reading

Bergman and Klefsjö, *Quality from Customer Needs to Customer Satisfaction*, Studentlitteratur, Lund 1995.

Teaching methods

The teaching consists of lectures, class-teaching, essay-writing, seminar practice, laboratory work, case and practical work. Participating in practical work and seminars is obligatory.

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9893 Reliability Engineering and Maintenance Optimization

April – June 2008

Level: B3

7.5 Swedish credit points

Part-time

The purpose of the course is to give students a basic knowledge of theory and methods in technical reliability and maintenance

optimisation and its economic influence on complex and smaller systems.

Contents

product safety
technical reliability analysis
the reliability theory of complex and small systems
maintenance optimisation
practical examples.

Prerequisites

Admission to the course requires 7.5 Swedish credit points in Business Economics, 22.5 Swedish credit points in Mathematics, 15 Swedish credit points in Mathematical Statistics and 7.5 credit points in Quality and Maintenance (equal to SEA915) and a knowledge of/experience in Industrial Measurement and Failure Analysis (equal to SEB911) or the equivalent.

Recommended reading

O'Conner Patrcck, *Practical Reliability Engineering*, John Wiley, 4th edition, 2002. Bergman & Klevsjö, *Quality from Customer Needs to Customer Satisfaction*, Studentlitteratur, Lund 1995. Sherwin & Bossche, *The Reliability, Availability Productivities of Systems*, Chapman & Hall 1993.

Teaching methods

The teaching consists of lectures, class-teaching, essay-writing, seminar practice, laboratory work, case and practical work. Participation in practical work and seminars is obligatory.

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9932 Facilities Planning and Production Management

January – March 2008

Level: B2

7.5 Swedish credit points

Part-time

The purpose of the course is to give the students some knowledge of the logistics system function and its role in satisfying stated customer needs at minimum costs. It particularly focuses on:
how to plan a new facility or update existing facilities to ensure that the facility's tangible

fixed assets best support the achievement of the overall business objective
how to plan and control the manufacturing process (including materials, machines, people and suppliers).

Contents

The course covers the following elements:

Part one:

product design, process design and schedule design
flow patterns and activity relations in different production types
space requirements: work station and departmental requirements (equipment, services, personnel, etc.)
material handling systems
facility layout design

Part two:

Manufacturing Planning and Control (MPC):
definition and framework
Material Requirement Planning (MRP and MRPII)
Just in Time (JIT)
capacity planning
production activity control and master production scheduling

Prerequisites

Admission to the course requires 7.5 Swedish credit points in Business Economics and Quality and 22.5 Swedish credit points in Mathematics, or the equivalent.

Recommended reading

Tompkins, White, Bozer, Frazelle, Tanchano, Trevino, *Facilities Planning*, 2nd edition (1996). Examined mostly through a case study.
Vollmann, Whybark, Berry, *Manufacturing Planning and Control Systems*, 4th edition (1997).
Basic material for the exam.

Teaching methods

The teaching consists of lectures, class-teaching, seminar practice, laboratory work, case studies (projects) and/or essay-writing on a practical subject. Participation in seminars and practical work is obligatory.

Assessment methods

The students' performance will be evaluated on the basis of a written project report, assignments and laboratory.

SE9873 Thesis

January – June 2008

Level: B3

15 Swedish credit points

Part-time

The purpose of this course is to give the students the necessary skills to write a scientific report according to the internal demands on a technical report as stated by the School of Technology and Design in “Rapport-instruktioner för TD”.

During the course the student should show his or her ability to apply the knowledge acquired during the studies.

The task should be reported as an academic paper or a scientifically based work report. All reports must be discussed in a seminar.

The report should be written in English unless special reasons can be presented.

Contents

The student is to conduct and report a major task of a research nature under the supervision of the tutor and the examiner.

The task should be found in an industrial environment, and cover 2–3 subjects within the Terotechnology area, (for example product quality, maintenance and life cycle cost) and their integration.

Prerequisites

The requirement for admission to the course is that the student has taken courses at B3 level in Terotechnology.

Teaching methods

Teaching consists of lectures on scientific methodology. In addition to this the student will receive supervision for performing his/her project.

Assessment methods

The students' performance will be evaluated on the basis of a written project report and the opposition of the student to another paper produced by students in the same subject.

Spring semester – Advanced level

Mechanical engineering

MT9984 Systems Engineering

Contact Person Håkan Bard

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School of Technology and Design

End of January–end of March 2008

Level: A

7.5 Swedish credit points

Part-time

Contents

The Systems Engineer, SE, faces the system user's needs and concerns, the project manager's financial and schedule constraints, and the capabilities and ambitions of the engineering specialists. The input at the conceptual design stage and in the role of interdisciplinary leadership in the realization of the project are key contributions of systems engineering, and it is indispensable to the

successful development of modern complex systems.

This course introduces SE as a powerful development tool with specific application to complex products, functions, and systems.

Prerequisites

The students must have completed at least 90 Swedish credit points in the subject of Mechanical Engineering.

Teaching methods

The teaching consists of lectures and case studies as project work.

Assessment methods

The examination will be based on a written examination and project work.

Terotechnology

SE9853 Thesis

January – June 2008

Level: A

30 Swedish credit points

Full-time

The purpose of this course is to give the students the necessary skills to write a scientific report according to the internal demands on a technical report as stated by School of Technology and Design in “Rapportinstruktioner för TD”.

Contents

The student is to conduct and report a major task of a research nature under the supervision of the tutor and the examiner.

The task should be found in an industrial environment, and cover 2–3 subjects within the Terotechnology area, (for example product quality, maintenance and life cycle cost) and their integration.

The focus of the report should be according to the profile chosen by the student.

The task should be reported as an academic paper or a scientifically based work report. All reports must be discussed in a seminar.

The report should be written in English unless special reasons can be presented.

Prerequisites

The requirement for admission to the course is that the student has taken courses at A level in Terotechnology.

Recommended reading

Idar Magne Holmer, Bernt Krohn Solvang, *Forskningsmetodik – om kvalitativa och kvantitativa metoder*, Studentlitteratur 1991. Jarl Backman, *Rapporter och uppsatser*, Studentlitteratur 1998. Erling S Andersson, Eva Schwencke, *Projektarbete – en vägledning för studenter*, Studentlitteratur 1998. B Klefsjö, H Eliasson, *De sju ledningsverktygen – för effektivare planering av förbättringsarbete*, 1999. *Publication Manual of the American Psychological Association*, (4th ed). Washington DC: American Psychological Association (1994).

Day, R. A., *How to Write & Publish a Scientific Paper* (5th ed.). Cambridge: Cambridge University Press, 1988. Jarick, A., Josephsson, H., Kennerfalk, L., Lundbäck, A., Sandström, M., *Från tanke till text*, Studentlitteratur. Graziano, A. M., Raulin, M.L., *Research Methods: a Process of Inquiry*, 4th ed. Boston: Allyn and Bacon, cop. 2000. Thurén, T, *Vetenskapsteori för nybörjare*, Liber, 1996.

Teaching methods

Teaching consists of lectures on scientific methodology. In addition to this the student will receive supervision for performing his/her project.

Assessment methods

The students' performance will be evaluated on the basis of a written project report and the opposition of the student to another paper produced by students in the same subject.

Contact persons

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