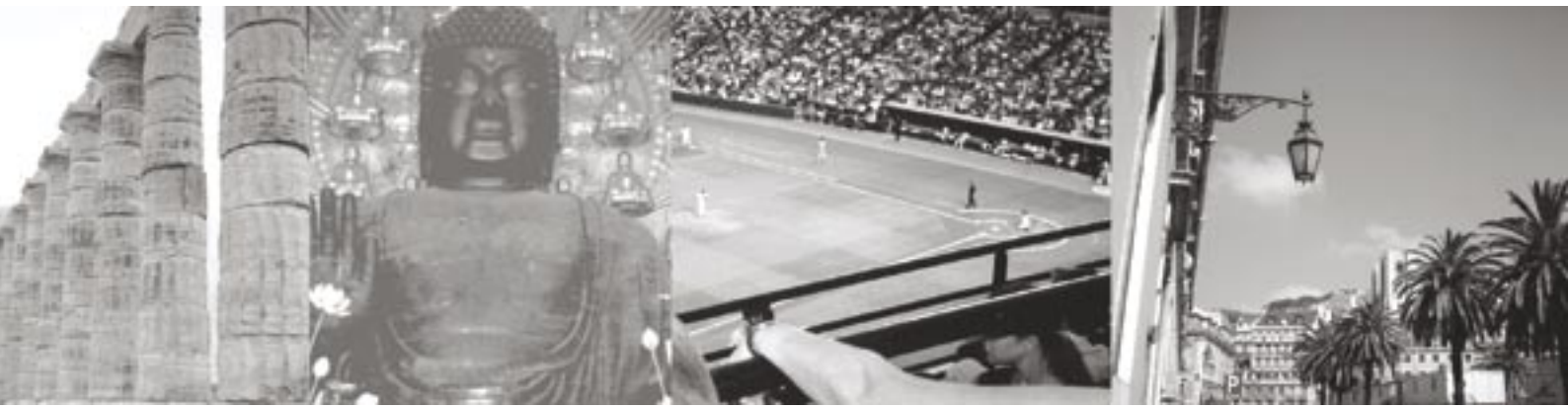

School of Technology and Design

Courses and programmes in English 2006 -2007

Växjö University

School of Technology and Design

PROGRAMMES 3-Years full-time
180 ECTS, bachelordegree

Energy Technology, focusing on Bioenergy Systems

Prerequisites
Completed high school education and a good command of English, Mathematics, Physics and Chemistry.

This programme is only open for exchange students. If you as an exchange student have any questions about admission, prerequisites etc, please contact the International Office at internationaloffice@adm.vxu.se.

Undergraduate Level, 120 points (180 ECTS)

The future development of the renewable and sustainable production of bioenergy in European countries is contingent upon; inter alias, the following key issues:

Availability of resources
Optimization of the energy wood utilization chains
Evaluation of the complete bioenergy system from biofuels production to thermochemical conversion for the production of valuable energy products (electricity and heat, and other products such as sustainable production of transport fuels)
Reducing costs of energy products
Reduction of the possible impact on the environment.

Degree
After finishing studies in the programme you can apply for a bachelordegree of Engineering in Bioenergy Systems or Bachelor of Science in Bioenergy Systems

PROGRAMMES 1-Year full-time
60 ECTS, masterdegree

Prerequisites
Degree, at least 180 ECTS in technical and/or economic areas or an equivalent foreign degree. The supplementary year is not a research preparatory course.

- Production Manager
The focus of this profile is building, developing and planning production, resources and flows, not only between different operations internally in the company, but also to and out of the production plant with respect to cost effectiveness. The profile prepares you for management positions in manufacturing and manufacturing logistics.

- Creative Quality Developer
This focus ranges from the design phase all the way to the moment when the customer has the product in her/his hand. The profile prepares you for management or expert functions in quality.

- Maintenance Designer
The profile forms a basis around the needs of planning quality – and maintenance actions with respect to the age and condition of the equipment. The purpose is to raise the reliability in operation, create long-term optimal resource usage and preserve the product quality level. New trends in maintenance technology are taught, especially condition-monitoring and condition-based maintenance. The profile prepares you for management functions in maintenance, expert functions in the areas of system and reliability technology and also Life Cycle Cost/Profit.

Degree
After finishing studies in the programme you can apply for a Master's degree with the profile: Production Manager, Creative Quality Developer or Maintenance Designer.

SINGLE SUBJECT COURSES

Bioenergy

Bioenergy Technology
September–December, Undergraduate beginners' level
5 credit points (7.5 ECTS)

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.

Environmental Science

Environmental Understanding in an International Perspective
September–December, Undergraduate beginners level
5 credit points (7.5 ECTS)

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 will contain a self-test to be completed and mailed to the teacher prior to the next chapter. There will also be at least one major individual exercise.

Forest and Wood Engineering

Science of Forestry
August–October, 2006, Undergraduate Level
5 credit points (7.5 ECTS)

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
Teaching methods
Teaching methods include lectures, seminars and excursions.

Operational efficiency
November-January, Undergraduate Level
5 credit points (7.5 ECTS)

The aim is to give the student knowledge of technology and methods for the logging, transport and handling of wood from the forest to the industry in Sweden. Wood as an energy source forms another part of the course. Work study is a major constituent of the course and is carried out as a project work on real life problems in forestry or a forest industry.

Forest Industry Markets
Spring, Undergraduate Level
5 credit points (7.5 ECTS)

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

Glass Chemistry and Technology

Glass Chemestry and Technology
February–March, Advanced Undergraduate Level
10 credit points (15 ECTS)

The course introduces the fundamentals of glass chemistry and technology for a wide range of products. It examines art and domestic glass, container glass, fiber glass, 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 most types of commercial glass.
Notice!
After completing this course the students may pursue further studies in the course Field Studies/Project Work, 10 credit points (15 ECTS).

Field Studies/Project Work
April–May, Advanced Undergraduate Level
10 credit points (15 ECTS)

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.

Mechanical Engineering

Industrial Design I
End of January–end of March, Undergraduate Level
5 credit points (7.5 ECTS)

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 looks 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.

Product Development I
Beginning of September–end of October, Undergraduate Level
5 credit points (7,5 ECTS)

The course contents of some of 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 and more.

Machine Design I
End of January–end of March, Undergraduate Level
5 credit points (7,5 ECTS)

The course contains the following parts: Introduction to the subject of machine design, selection and dimensioning of some fundamental machine elements/ parts. The dimensioning of design parts with regards to force flow, fatigue properties and risks of machine failures, calculation and dimensioning problems and Design project(s).

Machine Design II
Beginning of September–end of October, Undergraduate Level
5 credit points (7,5 ECTS)

The purpose of this course is to give the students the application of the mechanical design process, an understanding and knowledge of how to dimension and design some particular machine elements and parts. Practice in using standards and company catalogues. A comprehensive (overall) view of machine design work and training in design team-work. 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 every part in a gearbox, and to perform force analyses to see how the different parts affect each other.

The Finite Element Method
Beginning of November–end of December, Graduate Level
5 credit points (7.5 ECTS)

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. Also the skill required for using a FEM program to perform different types of analyses. The course covers: Strong and weak formulation of heat conduction and solid mechanics problems in

one or many dimensions, torsion and beam analysis. Finite element formulations, basis functions – different approximations. Constitutive relations (relations between stress –strain and flow – temperature gradient etc.) Principal stresses, different stress measures. Numerical integration, mapping, isoparametric elements, rate of convergence.

Systems Engineering
End of January–end of May, Graduate Level
5 credit points (7.5 ECTS)

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 role of interdisciplinary leadership is the key contribution 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.

Terotechnology

Technical Project Management and Report Writing
October–January, 5 credit points (7.5 ECTS)

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

Business-Driven Quality Maintenance
September-January, 5 credit points (7.5 ECTS)

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.

Information Systems in Technological Environments
January–March, 5 credit points (7.5 ECTS)

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

Information Systems Design in Technological Environments
April–June, 5 credit points (7.5 ECTS)
The purpose of the course is to give students a fundamental knowledge of information system development in a technological environment and also the foundations of computer programs that are used in a technological environment, especially in manufacturing processes.

Information models in industrial systems
November-January, 5 credit points (7.5 ECTS)

The purpose of the course is to give students knowledge about what kind of data should be stored and an understanding of what information is important and how it is gathered with respect to industrial systems. Furthermore knowledge about data modelling and knowledge about what opportunities industrial databases give to co-operation between different functions like production, maintenance, quality etc.

Computerised information handling for industrial systems
September–October, 5 credit points (7.5 ECTS)

The purpose of the course is to give students knowledge about how data and information is handled in databases and other computerised systems. 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

Industrial measurement and failure analysis
January–March, 5 credit points (7,5 ECTS)

The purpose is to give the studentsbasic technical knowledge of machine elements (function, characteristics, production etc.), failure causes and measurement techniques. And also knowledge about tribology and deterioration processes, e g wear, fretting and corrosion.

Facilities Planning and Production Management
January–March, 5 credit points (7.5 ECTS)

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. Furthermore how to plan and control the manufacturing process (including materials, machines, people and suppliers).

Quality Technology
January–March, 5 credit points (7.5 ECTS)

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.

Reliability Engineering and Maintenance Optimization
April–June, 5 credit points (7.5 ECTS)

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.

Condition Monitoring Technology
September–October, 5 credit points (7.5 ECTS)

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, a 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.

Maintenance Technology
September-January, 5 credit points (7.5 ECTS)

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. Furthermore a basic knowledge of theories and methods used in technical maintenance management in complex and smaller systems.

Industrial Integrated Case Study
September–January, 5 credit points (7.5 ECTS)

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 and to give an understanding of how these concepts, tools and methods may be used to show the maintenance role in the company's economy.

Technical LCC-LCP management
October–January 5 credit points (7.5 ECTS)

The purpose of the course is to make the student 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. Furthermore 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.

Six Sigma
September–October, 5 credit points (7.5 ECTS)

The purpose of the course is to give the students the background to Six Sigma and 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 and a knowledge about how Six Sigma works in practice.

Degree Project (SEC930)
January–June, 10 credit points (15 ECTS)

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 "Rapportinstruktioner 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.

Degree Project (SED930)
January–June, 20 credit points (30 ECTS)

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". 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.

Degree Project (SED932)
January–June, 10 credit points (15 ECTS)

The purpose of this course is to give students with a Bachelor's degree in Terotechnology an opportunity to take a Swedish Master's degree. 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 task should be reported as an academic paper or a scientifically based work report. All reports must be discussed in a seminar.

Procurement, Distribution and Operations Research

September–October, 5 credit points (7.5 ECTS)

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

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.

For details including prerequisites and more please visit:
www.vxu.se/td/english/edu/

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