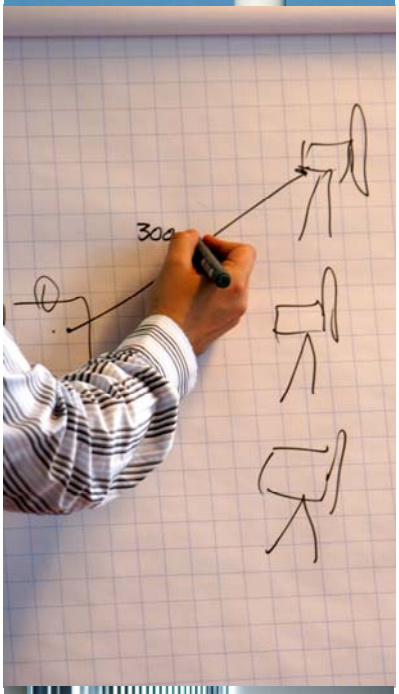

# Course Catalogue

# 2011

DUWET

Danish University **Wind Energy Training**

Risø DTU, AAU & AU

# General information

DUWET is owned by Aarhus University and is a co-operation between Risoe DTU, Aalborg University and Aarhus University.
DUWET offers a variety of courses and consulting activities regarding research based training within the area of wind energy development. Levels vary, but all of our activities are aimed at professionals employed in the wind energy industry.

We run a set of standardized, short-term courses on a regular basis:

- **Wind Energy Basic Courses**
  for engineers
- **Wind Energy Basic Courses**
  for generalists
- **Basic Courses**
  Offshore Wind
- **Wind Energy Advanced Courses**
  for R&D engineers and project managers

We also provide

- Specially designed courses as in-house training tailored for our customers
- Key note speakers for conferences, and consulting in wind turbine R&D, siting and energy systems.

## Locations

All DUWET courses can be arranged at other locations in Denmark as well as abroad.

Further, we can adopt courses to specific company needs such as location, date and contents.

## Amount and price

The amount and price can be found under each course description. Course materials, course certificate, and all meals during the course day are included in the price. The price does not include hotel accommodation or travel arrangements.
All prices are exclusive VAT.

## Contact / registration

For further information please contact:

DUWET, Birk Centerpark 15, DK-7400 Herning, www.duwet.dk

Steen Mortensen, Head of Centre,
e-mail: steenm@duwet.dk, phone +45 96 29 63 63. Mobile +45 24 86 46 03

Randi Faaborg-Hansen, Assistant,
e-mail: randi@duwet.dk, phone +45 96 29 63 64

## Cancellation

If a participant in a course cancels later than 14 days before the start of the course, half of the normal price of the course will be invoiced.
If the same participant signs up for and finishes the same course within the next year, only the last half of the price for the finished course will be invoiced.

DUWET reserves the right to cancel the course if not enough people have enrolled .

# 2011 DUWET Courses

## overview






Danish University Wind Energy Training
Birk Centerpark 15 7400 Herning www.duwet.dk duwet@duwet.dk Phone +45 96 29 63 63

# 2011

# Wind Energy Basic Course for Engineers

**2-6**

**May 2011**

**10-14**

**October 2011**

**Target audience**

The target audience is primarily newly hired engineers. However, the training course can also be of interest for engineers with several years of service who need an up-to-date picture of the business and the different technologies used in the business. It is a prerequisite that the participants have a general interest in wind turbine technique outside their own specialty and work area.

**Professional level**

The levels of the training courses all match the starting point of engineers who do not have this as their work area. This means that e.g. during the part of the training course that focuses on wind, the participants occupied with siting may be able to contribute to the teacher's presentation.

The professional level can be defined as the level on which sales engineers and engineer customers communicate. In particular the training course will focus on explaining technical characteristics and operational principles.

**Background**

Every year a large number of engineers are hired within the wind turbine industry. These engineers are specialists in different areas such as hydraulics, gear, welding, production control etc. Most of these specialists have a lack of knowledge of wind turbine technique and the wind turbine business in general.

We have developed this Wind Energy Basic Course in order to provide an overview of the totality that these specialties are going to be a part of. Within one week the participants will get a systematic presentation of the work areas of other engineers in the wind power business. Without this training course a newly hired engineer would have to spend much time and energy on gaining this knowledge within the first years of his service. The Wind Energy Basic Course will enable the newly hired engineers to communicate with their new colleagues sooner and more efficiently.

**Instructors**

All our instructors are experienced people from the wind energy industry or professors/ associate professors from one of the universities (see page 16).

**Place**

The course takes place at Innovatorium, Birk Centerpark 40, 7400 Herning.

**Price**

€ 2,725 per person for 5 days. Course materials, course certificate, and all meals during the course day are included in the price.

The price does not include hotel accommodation or travel arrangements.

**Deadline for registration**

At the latest 2 weeks before start.

Approximately one week before the course commences, the participants receive an e-mail accompanied by a list of participants.



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# 2011 Wind Energy Basic Course for Engineers

## Programme

| | Morning (09:00 - 12:00) | Afternoon (13:00 - 16:00) |
|---|---|---|
| **DAY 1** | • **Welcome**<br>by Steen Mortensen, DUWET<br>• **Multiple choice**<br>• **The business**<br>o Development and characteristics<br>o Environmental and energy policy<br>o The future: trends, potential and risks | • **Wind**<br>o Wind<br>o Siting<br>o Production<br>o Power curve, frequency distribution |
| **DAY 2** | • **Wind turbine design loads**<br>o Wind turbine loads (physics and modelling)<br>* Wind<br>* Aerodynamics<br>* Structural dynamics<br>* Dynamic tuning<br>* Aero elasticity<br>* Control<br>o Design Basis<br>o Load analysis | o Design basis<br>* IEC61400-1<br>* Design load cases<br>* Load simulations, examples<br>o Load analysis<br>* Ultimate loads<br>* Fatigue loads<br>* Important load cases? |
| **DAY 3** | • **Mechanics**<br>o Review of the major components of wind turbines<br>o Operational principles<br>o Criteria of dimensions<br>o Materials<br>o Manufacturing and logistics | • **Control and regulation**<br>o General information about control and regulation<br>o Active stall regulation<br>o Pitch/variable speed with a double-fed asynchronous generator |
| **DAY 4** | • **Grid integration**<br>o Structure of the electricity system<br>o Quality of electricity (reactive effect, profiles of voltage, flickers, harmonic)<br>o Construction of wind turbines and influency on quality of electricity<br>o Frequency and regulation of voltage and the perspectives of wind turbines<br>o System stability, protection, and the influence and perspectives of wind turbines | • **How to develop a good project**<br>o The site<br>o Logistics<br>o Expectations |
| **DAY 5** | • **Market**<br>o Turbine types<br>o Sales parameters<br>o Wind turbines of the future<br>• **The right answers for the Multiple Choice questionnaire**<br>• **Evaluation of the course** | |



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# 2011

# Wind Energy Basic Course for Generalists

**12-14**

**April 2011**

**27-29**

**September 2011**

**Target audience?**
This special course is intended to strengthen the all round Wind Power knowledge of employees in the wind industry. The participants will achieve a broad range of technical terms and understanding for the physics related to generating electricity from wind. Starting with an introduction to the industry, followed by simplified explanation to the winds kinetic energy, the participants will learn about the engineering challenges their colleagues deal with on aerodynamics, structural mechanics, control systems and power quality. The role of wind energy as a supplier to the public electricity grid is explained and various brands of wind turbines are introduced.

**Instructors**
All our instructors are experienced people from the wind energy industry or professors/ associate professors from one of the universities (see page 16).

**Place**
The course takes place at Innovatorium, Birk Centerpark 40, 7400 Herning.

**Price**
€ 1,635 per person for 3 days. Course materials, course certificate, and all meals during the course day are included in the price.
The price does not include hotel accommodation or travel arrangements.

**Deadline for registration**
At the latest 2 weeks before start.
Approximately one week before the course commences, the participants receive an e-mail accompanied by a list of participants.


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# 2011 Wind Energy Basic Course for Generalists

## Programme

| | Morning (09:00 - 12:00) | Afternoon (13:00 - 16:00) |
|---|---|---|
| **DAY 1** | • **Welcome and introduction**<br>• **Multiple Choice questionnaire**<br>• **The Wind Industry**<br>o History and character<br>o Energy and environmental politics<br>o The tendencies for the future<br><br>The participants are introduced to each other and DUWET.<br>Based on a multiple choice questionnaire the participants will do their personal testing on their knowledge on the subject in the entire course.<br>The history of the wind industry is explained along with the most important mile-stone events that brought the industry to where it is today. | • **Wind Turbine Mechanics**<br>o Blades<br>o Nacelle<br>o Tower<br>o Controller<br>o Foundation<br>• **Loads on Wind Turbines**<br><br>The mechanical and electrical components in a modern wind turbine are introduced.<br>Loads and load cycles are explained in a simplified manner. |
| **DAY 2** | • **Wind Turbine Applications**<br>• **Aerodynamics**<br>• **Stall-pitch and variable speed**<br>• **Various brands of wind turbines**<br><br>A thorough explanation to the aerodynamics of a wind turbine blade is given. We even learn what makes the bumble bee fly, before we commence the more serious debate about pros and cons of stall- pitch and variable speed regulation. Furthermore, the most common and some creative brands on and off the market are introduced. | • **Wind Energy**<br>o The kinetic energy of the wind<br>o Wind spectrum<br>o Power curve and energy yield<br>o Calculation of a project<br><br>A brief description of the physics in wind is given to understand the complexity of predicting the future production of a wind turbine. Terms such as wind speed average, gusts and turbulence are explained. Terrain influence and analysis is demonstrated by means of the wind atlas calculation methodology. Finally a full wind study is introduced. |
| **DAY 3** | • **Grid Connection**<br>• **Generators**<br>• **Power Quality**<br>• **Power over run**<br><br>The function of the asynchronous generator is explained. And other types of generators are introduced. The implications of connecting wind turbines to the grid and how they interact with other suppliers of electricity. The special West Danish phenomenon of power over run is explained. | • **Wind Power Projects**<br>o Buyers of wind power plants<br>o The milestones of a project<br>o Operation and maintenance<br>• **Multiple Choice results**<br>• **Evaluation of the course**<br><br>Based on examples from the real world, various types of customers and factors that play a role in a wind power plant are introduced. The important contracts in a project is explained and discussed.<br>Finally the participants get a summary of answers to the multiple choice questionnaire, before we finish by evaluating the outcome of the course. |



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# 2011

# Wind Energy Basic Course
## Offshore

**25-26**

**May 2011**

**26-27**

**October 2011**

**Target audience**
The target audience is primarily employees in the wind industry who want to learn about the special challenges and technologies of offshore wind. A certain degree of advanced knowledge of general wind energy production is an advantage but not a requirement. The course participants will learn about solutions to the special challenges in producing wind energy offshore.

**Course description**
The course will impart to the participants knowledge about the common technologies underlying modern offshore wind power production and knowledge about how offshore wind energy production differs from onshore wind energy production. Part of the course deals with the challenges of transporting the electricity generated by offshore wind turbines to the electricity grid. Another part of the course deals with Installation, Operation & Maintenance and Health, Safety, Environment and Quality.

**Time and price**
The course is conducted over 2 days from 9:00 am to 16:00 pm.

The price is €1,090 per participant. Course materials, course certificate and all meals during the course are included in the price.
The price does not include hotel accommodation and travel arrangements.

**Instructors**
*Torben Juul Larsen, Risoe DTU*
*Lars Møller Nielsen, Vestas Offshore*
*Patrik Passon, RAMBOELL Wind Energy*
*Birgitte Bak-Jensen, Aalborg University*

**Place**
The course takes place at Innovatorium, Birk Centerpark 40, 7400 Herning.

**Deadline for registration**
2 weeks before start at the latest.
Approximately one week before the course starts, the participants receive an e-mail accompanied by a list of participants.

Changes in the programme may occur


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# 2011 Wind Energy Basic Course Offshore

## Programme

| | Morning (9-12) | Afternoon (13-16) |
|---|---|---|
| Day 1 | • **Welcome**<br>Coffee<br>Introduction to the course and presentation of the participants<br>• **Offshore Wind Turbines**<br>• **Wake**<br>• **Shadows and Loads** | • **Foundations**<br>An introduction and characterization of the different foundation types for bottom-mounted offshore wind turbines is given.<br>• **Wave Loads**<br>Wave loads as the main hydrodynamic loading component are explained and the most important influences from interacting aerodynamic loads are shown.<br>• **Scour**<br>Scouring effects and scour protection types are introduced. |
| Day 2 | • **Welcome**<br>Coffee, summery from day 1 and introduction to day 2<br>• **Grid Connection**<br>• **Transport and control of power**<br>During the course different aspects regarding the wind power penetration in DK will be considered, as for instance:<br>o Problems about the balancing the power at large wind power penetrations<br>o Requirements in the grid codes for connection of wind farm, regarding power, voltage and frequency control and fault ride through capabilities.<br>o Reliability analysis of the produced wind power | • **Installation, Service and Maintenance**<br>• **HSEQ**<br>(Health, Safety, Environment and Quality)<br>• **Evaluation of the course** |


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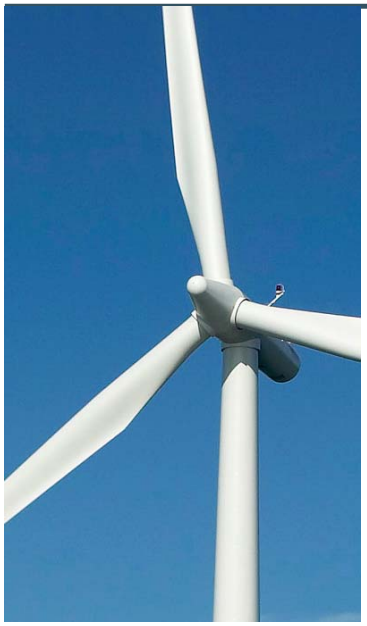
# 2011

# Wind Energy Course

## for Developers

NEW COURSE



**23-25**

**August 2011**

**22-24**

**November 2011**

A unique course for developers of wind farms.

### Course description

The course offers a great way of gaining insight into the different processes and steps involved in developing a wind farm; from finding the ideal locations to the actual operation of the wind farm.
The course provides the attendees with a thorough knowledge of the roles of all the stakeholders involved in a wind farm development, such as landowners, turbine manufacturers, grid operators, etc.

### Programme

| Day | Morning (09:00 - 12:00) | Afternoon (13:00 - 16:00) |
|---|---|---|
| 1 | • **Welcome**<br>• **Multiple choice**<br>• **The overview of project development** | • **Site selection**<br>o Site evaluation<br>o Wind assessment<br>o Environmental impact<br>o Turbine selection |
| 2 | • **Site selection**<br>o Grid connection<br>o Land agreement<br>o Permits | • **Finance and legal aspects**<br>o Feasibility studies<br>o Legal and financial setup<br>o Supply Contracts and PPA |
| 3 | • **Realization**<br>o Transport to site<br>o Construction<br>o Cranes<br>o Erection of WTGs<br>o Commissioning | • **Operation**<br>o O&M agreement<br>o Insurance agreement<br>o Site management<br>• **Right answers for the Multiple Choice questionnaire**<br>• **Evaluation of the course** |

### Language

The language of instruction is either Danish or English, depending on the participants' language skills.

### Place

The course takes place at Innovatorium, Birk Centerpark 40, 7400 Herning.

### Amount and price

The course lasts 3 days and the price is **€ 1,950** per person. Course materials, course certificate, and all meals during the course day are included in the price.
The price does not include hotel accommodation or travel arrangements.

### Deadline for registration

At the latest 2 weeks before start.
Approximately one week before the course commences, the participants receive an e-mail accompanied by a list of participants.

Changes in the programme may occur



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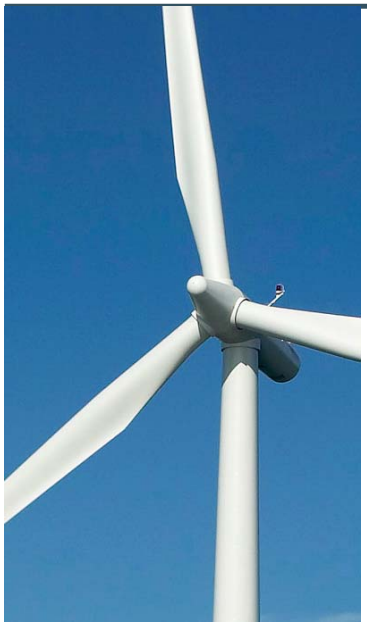
# 2011

# Project Management
## of Complex Engineering Projects



**2-3**

**February 2011**

**7-8**

**September 2011**

Changes in the programme may occur

### Prerequisites
The course presupposes a basic knowledge of the organisation and working method of technical projects and experience in engineering construction and design.

### Objectives of the course
The course objective is to provide the participant with an overview of the subject *project management of complex engineering projects*. This includes project management tools/ methods and process tools as well as appreciation of different types of project methods. External presentations, project cases and the participants' own experiences help develop a profound insight into the dynamics of complex engineering projects, management tools and project management and organisation for the course participants. In this connection, the course invites the participants to reflect on the possibilities and limitations of the various management tools and the different management and organisational structures.

### Course description
The course examines basic concepts which are necessary for the understanding of project management and complex engineering projects. Furthermore, the most important management tools as well as management and organisational structures are presented and practised.

The following subjects are covered by the course:
- The participants' experiences with large complex projects
- Basic concepts necessary for understanding projects and project management
- Cases, practical experiences from other companies and projects
- Key management tools
- Project management types
- Project organisation types
- Exercises in project management

The learning methods for developing knowledge of the subjects mentioned above are varied and inspirational, including presentations, dialogues, group assignments and small individual assignments.

Preparation and subsequent recapitulation (debriefing) in the participant's own organisation are presupposed.

The language of instruction is either Danish or English, depending on the participants' language skills.

### Instructor
Professor Christian Koch, Aarhus University, email: christian@hih.au.dk.

### Place
The course takes place at Innovatorium, Birk Centerpark 40, 7400 Herning.

### Amount and price
The course lasts 2 days and the price is **€ 1,380** per person. Course materials, course certificate, and all meals during the course day are included in the price.
The price does not include hotel accommodation or travel arrangements.

### Deadline for registration
At the latest 2 weeks before start.
Approximately one week before the course commences, the participants receive an e-mail accompanied by a list of participants.



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# 2011 Composite structures

**2-3**

**March 2011**

**14-15**

**September 2011**

**Prerequisites**
The course presupposes a basic knowledge of solid mechanics - the level of which should equal that of a bachelor of engineering in mechanical engineering .

**Objectives of the course**
Polymeric resin fibre reinforced materials (FRP´s or composite materials) are being used increasingly for structural applications where properties such as high strength, high stiffness and low weight are determining design parameters. The course objective is to provide the participants with a basic knowledge of general principles and theories within analysis and design of structures made of polymer based fibre-reinforced composites. In particular, the participants will be presented with the basic elements within the classic analysis methods for describing the structural behaviour of composites (laminates).

**Course description**
The course presents the classic methods which are applied when analysing composites.

The following subjects are covered by the course:
- Composite structures: Past, present and future
- Fibre and resin materials: Types and properties
- Macro mechanics
- Micromechanics
- Classical laminate theory
- First order shear deformation theory
- Introduction to design and optimisation of composites

The subjects above are partly taught by means of small assignments which are solved in connection with the course.

**Instructor**
Professor Erik Lund, University of Aalborg, e-mail: el@ime.aau.dk.

**Language**
The language of instruction is either Danish or English, depending on the participants' language skills.

**Place**
The course takes place at Innovatorium, Birk Centerpark 40, 7400 Herning.

**Amount and price**
The course is conducted over two days (1 ECTS) and the price is **€ 1,380** per person. Course materials, course certificate, and all meals during the course day are included in the price.
The price does not include hotel accommodation or travel arrangements.

**Deadline for registration**
At the latest **3 weeks** before start.
Approximately one week before the course commences, the participants receive an e-mail accompanied by a list of participants.

Changes in the programme may occur


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# 2011 Optimisation of Technical Business Processes

**Prerequisites**
The course presupposes a basic knowledge of the organisation and working methods of the company's technical departments and experience in engineering construction and design.

**Objectives of the course**
The objective of the course is to provide the participant with an overview of dynamics, methods and tools for improving the problem solving processes in the company's technical departments. The procedures for order processing, construction and production etc. are often considered to be suboptimal. Even a minor process improvement effort is able to produce a great effect. The course introduces the participant to business processes and how these processes may be optimised by means of new procedures, division of labour, resource allocation, management and organisation.

**Course description**
The course examines basic concepts which are necessary for the understanding of technical business processes. Furthermore, the most important management tools as well as management and organisational structures are presented and practised.

The following subjects are covered by the course:

- The participants' experiences with technical business processes
- Basic concepts necessary for understanding business processes
- Cases, practical experiences from other engineering companies
- Central process optimisation tools
- Changes in the division of labour, human resources
- Changes in business processes
- IT application, document control, workflow
- Exercises in process optimisation

The learning methods for developing knowledge of the subjects mentioned above are varied and inspirational, including presentations, dialogues, group assignments and small individual assignments. Preparation and subsequent recapitulation (debriefing) in the participant's own organisation are presupposed.

**Instructor**
Professor Christian Koch, Aarhus University, email: christian@hih.au.dk.

**Language**
The language of instruction is either Danish or English, depending on the participants' language skills.

**Place**
The course takes place at Innovatorium, Birk Centerpark 40, 7400 Herning.

**Amount and price**
The course is conducted over two days (1 ECTS) and the price is **€ 1,380** per person. Course materials, course certificate, and all meals during the course day are included in the price. The price does not include hotel accommodation or travel arrangements.

**Deadline for registration**
At the latest 2 weeks before start.
Approximately one week before the course commences, the participants receive an e-mail accompanied by a list of participants.

Changes in the programme may occur



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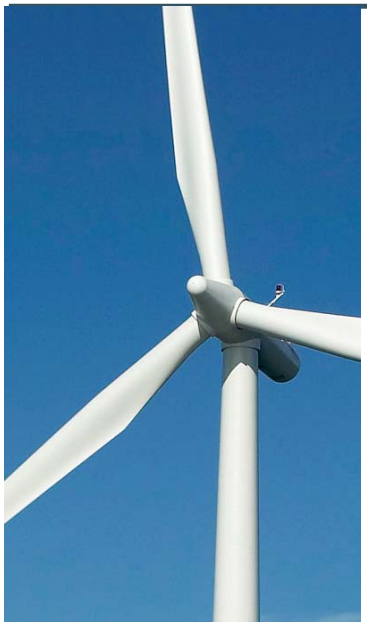
# 2011

# Intercultural Communication Competencies



**6**

**April 2011**

**21**

**September 2011**

**Prerequisites**
Good command of English.

**Course Objectives**
The objective of this course is to give participants a good understanding of own cultural basis and how it interrelates with other different main cultures.
The course will discuss both verbal codes as well as non – verbal codes in different cultural contexts.
The course will equip participants with useful tools to access cultural differences, based on Hofstedes five dimensions.

**Course Description**
Management and communication in a global setting is a highly complex task, affected by numerous understandings of culture both as individual, social and national bounded values.
Through the course, we will focus on the concept of culture as well as how to approach diverse cultures in an organizational and international context. The subject will be introduced in the light of both managerial and social science approaches and theories. Furthermore, case material will illustrate solutions of cultural conflicts and constructive understanding and communication across cultures, which can be incorporated in working procedures.

**Instructor**
Joergen Mouridsen, Associate Professor, Aarhus University, e-mail jorgenmo@hih.au.dk

**Place**
The course takes place at Innovatorium, Birk Centerpark 40, 7400 Herning.

**Price**
**€ 545** per person. Course materials, course certificate, and all meals during the course day are included in the price.
The price does not include hotel accommodation or travel arrangements.

**Deadline for registration**
At the latest 2 weeks before start.
Approximately one week before the course commences, the participants receive an e-mail accompanied by a list of participants.

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# 2011 Technical Change Management

**Prerequisites**
The course presupposes basic knowledge of organisational change, participation in technical projects and experience in engineering construction and design.

**Objectives of the course**
The course objective is to provide the participants with knowledge and appreciation of the dynamics of the complex circumstances underlying technical and organisational change processes, in particular the change processes which are related to change within the engineering field of the company.

Engineers and technicians are often assigned the responsibility for change projects which are subject to different and more extensive demands than technical projects are. Typically, changes will put managers and employees in situations which necessitate judgement, flexibility and contextual decision-making. The course will shed light on change processes, including their unpredictability and complexity. In addition, management process aids and tools are addressed based on the participants' own experiences.

**Course description**
The course examines basic concepts which are necessary for the understanding of change processes. Furthermore, the most important change management tools are presented and practised.

The following subjects are covered by the course:

- The participants' change experiences
- Basic concepts necessary for understanding change processes
- Change management
- Technical changes
- Organisational changes
- Exercises in change management

The learning methods for developing knowledge of the subjects mentioned above are varied and inspirational, including presentations, dialogues, group assignments and small individual assignments.

**Instructor**
Professor Christian Koch, University of Aarhus, email: christian@hih.au.dk.

**Language**
The language of instruction is either Danish or English, depending on the participants' language skills.

**Place**
The course takes place at Innovatorium, Birk Centerpark 40, 7400 Herning.

**Amount and price**
The course is conducted over two days (1 ECTS) and the price is **€ 1,380** per person. Course materials, course certificate, and all meals during the course day are included in the price. The price does not include hotel accommodation or travel arrangements.

**Deadline for registration**
At the latest 2 weeks before start.
Approximately one week before the course commences, the participants receive an e-mail accompanied by a list of participants.

Changes in the programme may occur


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# 2011

# Multivariable Feedback Control

**8-9**

**June 2011**

**9-10**

**November**

**Prerequisites**
Mathematics on the level of bachelor in electrical or mechanical engineering.

**Objectives of the course**
The course comprises a concise introduction to classical state space methods in control engineering. The course discusses linear dynamical systems, their time responses and stability. It will be shown how to design a feedback control which makes a physical system stable.
If not all required measurements are available an observer technique is used to estimate missing data. This is the contents of the second part of the course.

**Course description**

- Definition of a linear control system, from the physical model to state space, state transformations;
- Time response of a linear dynamical system, stability of linear dynamical systems: role of eigenvalues and Lyapunov equations
- Controllability and canonical form
- Pole assignment
- Linear quadratic control
- Observability and canonical form, Luenberger estimator
- Separation Principle and Integral Control
- Observer based control

**Instructor**
Professor MSO Rafael Wisniewski, e-mail raf@control.aau.dk

**Language**
The language of instruction is either Danish or English, depending on the participants' language skills.

**Place**
The course takes place at Innovatorium, Birk Centerpark 40, 7400 Herning.

**Amount and price**
The course is conducted over two days (1 ECTS) and the price is **€ 1,340** per person. Course materials, course certificate, and all meals during the course day are included in the price. The price does not include hotel accommodation or travel arrangements.

**Deadline for registration**
At the latest **3 weeks** before start.
Approximately one week before the course commences, the participants receive an e-mail accompanied by a list of participants.

Changes in the programme may occur



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# 2011 Instructors

**Anders Steen Nielsen**
LAC Engineering ApS

**Armin Solies**
DEIF A/S

**Birger Madsen**
BMT Counsult ApS

**Birgitte Bak-Jensen**
University of Aalborg

**Bo J. Bjerregaard**
Vestas Offshore A/S

**Prof. Christian Koch**
Aarhus University

**Claus Schrøder**
FloDesign Wind Turbines

**Erik V. Poulsen**
Alpha Wind Energy

**Prof. Erik Lund**
University of Aalborg

**Gillian Smith**
Garrad Hassan

**Jean-Francois Corbett**
Garrad Hassan

**Jørgen Højstrup**
Suzlon Energy A/S

**Jørgen Mouridsen**
Aarhus University

**Lars-Bo Albinus**
K2 Management

**Lars Høst Johansen**
Vestas Northern Europe A/S

**Lars Møller Nielsen**
Vestas Wind Systems

**Patrik Passon**
Ramboll Wind Energy

**Rafel Wisniewsk**
University of Aalborg

**Sune Baun Christensen**
LAC Engineering ApS

**Svend Enevoldsen**
Viking Windfarms A/S

**Thorben G. Nielsen**
Siemens Wind Power A/S

**Torben Juul Larsen**
Risø DTU

**Wiebke Langreder**
Suzlon Energy A/S



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# 2011 Course Calendar

## January - June 2011


Course Calendar - Spring 2011 - Danish University Wind Energy Training

| JANUARY | | | FEBRUARY | | | MARCH | | | APRIL | | | MAY | | | JUNE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sa | 1 | | Tu | 1 | | Tu | 1 | | F | 1 | | Su | 1 | | W | 1 | |
| Su | 2 | | W | 2 | Project Management | W | 2 | Composite structures | Sa | 2 | | M | 2 | Wind Energy Basic - Engineers | Th | 2 | |
| M | 3 | 1 | Th | 3 | Project Management | Th | 3 | Composite structures | Su | 3 | | Tu | 3 | Wind Energy Basic - Engineers | F | 3 | |
| Tu | 4 | | F | 4 | | F | 4 | | M | 4 | 14 | W | 4 | Wind Energy Basic - Engineers | Sa | 4 | |
| W | 5 | | Sa | 5 | | Sa | 5 | | Tu | 5 | | Th | 5 | Wind Energy Basic - Engineers | Su | 5 | |
| Th | 6 | | Su | 6 | | Su | 6 | | W | 6 | Intercult. Commun. Compenencies | F | 6 | Wind Energy Basic - Engineers | M | 6 | 23 |
| F | 7 | | M | 7 | 6 | M | 7 | 10 | Th | 7 | | Sa | 7 | | Tu | 7 | |
| Sa | 8 | | Tu | 8 | | Tu | 8 | | F | 8 | | Su | 8 | | W | 8 | Multivariable Feedback Control |
| Su | 9 | | W | 9 | | W | 9 | | Sa | 9 | | M | 9 | 19 | Th | 9 | Multivariable Feedback Control |
| M | 10 | 2 | Th | 10 | | Th | 10 | | Su | 10 | | Tu | 10 | | F | 10 | |
| Tu | 11 | | F | 11 | | F | 11 | | M | 11 | 15 | W | 11 | | Sa | 11 | |
| W | 12 | | Sa | 12 | | Sa | 12 | | Tu | 12 | Wind Energy Basic - Generalists | Th | 12 | | Su | 12 | |
| Th | 13 | | Su | 13 | | Su | 13 | | W | 13 | Wind Energy Basic - Generalists | F | 13 | | M | 13 | 24 |
| F | 14 | | M | 14 | 7 | M | 14 | EWEA 2011, Brussels, Belgium | Th | 14 | Wind Energy Basic - Generalists | Sa | 14 | | Tu | 14 | |
| Sa | 15 | | Tu | 15 | | Tu | 15 | EWEA 2011, Brussels, Belgium | F | 15 | | Su | 15 | | W | 15 | |
| Su | 16 | | W | 16 | | W | 16 | EWEA 2011, Brussels, Belgium | Sa | 16 | | M | 16 | 20 | Th | 16 | |
| M | 17 | 3 | Th | 17 | | Th | 17 | EWEA 2011, Brussels, Belgium | Su | 17 | | Tu | 17 | | F | 17 | |
| Tu | 18 | | F | 18 | | F | 18 | | M | 18 | 16 | W | 18 | | Sa | 18 | |
| W | 19 | | Sa | 19 | | Sa | 19 | | Tu | 19 | | Th | 19 | | Su | 19 | |
| Th | 20 | | Su | 20 | | Su | 20 | | W | 20 | | F | 20 | | M | 20 | 25 |
| F | 21 | | M | 21 | 8 | M | 21 | 12 | Th | 21 | | Sa | 21 | | Tu | 21 | |
| Sa | 22 | | Tu | 22 | | Tu | 22 | | F | 22 | | Su | 22 | | W | 22 | |
| Su | 23 | | W | 23 | | W | 23 | | Sa | 23 | | M | 23 | 21 | Th | 23 | |
| M | 24 | 4 | Th | 24 | | Th | 24 | | Su | 24 | | Tu | 24 | | F | 24 | |
| Tu | 25 | | F | 25 | | F | 25 | | M | 25 | 17 | W | 25 | Wind Energy Basic - Offshore | Sa | 25 | |
| W | 26 | | Sa | 26 | | Sa | 26 | | Tu | 26 | | Th | 26 | Wind Energy Basic - Offshore | Su | 26 | |
| Th | 27 | | Su | 27 | | Su | 27 | | W | 27 | | F | 27 | | M | 27 | 26 |
| F | 28 | | M | 28 | 9 | M | 28 | 13 | Th | 28 | | Sa | 28 | | Tu | 28 | |
| Sa | 29 | | | | | Tu | 29 | | F | 29 | | Su | 29 | | W | 29 | |
| Su | 30 | | | | | W | 30 | | Sa | 30 | | M | 30 | 22 | Th | 30 | |
| M | 31 | 5 | | | | Th | 31 | | | | | Tu | 31 | | | | |

## July - December 2011

Course Calendar - Autumn 2011 - Danish University Wind Energy Training

| JULY | | | AUGUST | | | SEPTEMBER | | | OCTOBER | | | NOVEMBER | | | DECEMBER | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F | 1 | | M | 1 | 31 | Th | 1 | | Sa | 1 | | Tu | 1 | | Th | 1 | |
| Sa | 2 | | Tu | 2 | | F | 2 | | Su | 2 | | W | 2 | | F | 2 | |
| Su | 3 | | W | 3 | | Sa | 3 | | M | 3 | 40 | Th | 3 | | Sa | 3 | |
| M | 4 | 27 | Th | 4 | | Su | 4 | | Tu | 4 | | F | 4 | | Su | 4 | |
| Tu | 5 | | F | 5 | | M | 5 | 36 | W | 5 | | Sa | 5 | | M | 5 | 49 |
| W | 6 | | Sa | 6 | | Tu | 6 | | Th | 6 | | Su | 6 | | Tu | 6 | |
| Th | 7 | | Su | 7 | | W | 7 | Project Management | F | 7 | | M | 7 | 45 | W | 7 | |
| F | 8 | | M | 8 | 32 | Th | 8 | Project Management | Sa | 8 | | Tu | 8 | | Th | 8 | |
| Sa | 9 | | Tu | 9 | | F | 9 | | Su | 9 | | W | 9 | Multivariable Feedback Control | F | 9 | |
| Su | 10 | | W | 10 | | Sa | 10 | | M | 10 | Wind Energy Basic - Engineers | Th | 10 | Multivariable Feedback Control | Sa | 10 | |
| M | 11 | 28 | Th | 11 | | Su | 11 | | Tu | 11 | Wind Energy Basic - Engineers | F | 11 | | Su | 11 | |
| Tu | 12 | | F | 12 | | M | 12 | 37 | W | 12 | Wind Energy Basic - Engineers | Sa | 12 | | M | 12 | 50 |
| W | 13 | | Sa | 13 | | Tu | 13 | | Th | 13 | Wind Energy Basic - Engineers | Su | 13 | | Tu | 13 | |
| Th | 14 | | Su | 14 | | W | 14 | Composite structures | F | 14 | Wind Energy Basic - Engineers | M | 14 | 46 | W | 14 | |
| F | 15 | | M | 15 | 33 | Th | 15 | Composite structures | Sa | 15 | | Tu | 15 | | Th | 15 | |
| Sa | 16 | | Tu | 16 | | F | 16 | | Su | 16 | | W | 16 | | F | 16 | |
| Su | 17 | | W | 17 | | Sa | 17 | | M | 17 | 42 | Th | 17 | | Sa | 17 | |
| M | 18 | 29 | Th | 18 | | Su | 18 | | Tu | 18 | | F | 18 | | Su | 18 | |
| Tu | 19 | | F | 19 | | M | 19 | 38 | W | 19 | | Sa | 19 | | M | 19 | 51 |
| W | 20 | | Sa | 20 | | Tu | 20 | | Th | 20 | | Su | 20 | | Tu | 20 | |
| Th | 21 | | Su | 21 | | W | 21 | Intercult. Commun. Compenencies | F | 21 | | M | 21 | 47 | W | 21 | |
| F | 22 | | M | 22 | 34 | Th | 22 | | Sa | 22 | | Tu | 22 | Wind Energy Course Developers | Th | 22 | |
| Sa | 23 | | Tu | 23 | Wind Energy Course Developers | F | 23 | | Su | 23 | | W | 23 | Wind Energy Course Developers | F | 23 | |
| Su | 24 | | W | 24 | Wind Energy Course Developers | Sa | 24 | | M | 24 | 43 | Th | 24 | Wind Energy Course Developers | Sa | 24 | |
| M | 25 | 30 | Th | 25 | Wind Energy Course Developers | Su | 25 | | Tu | 25 | | F | 25 | | Su | 25 | |
| Tu | 26 | | F | 26 | | M | 26 | 39 | W | 26 | Wind Energy Basic - Offshore | Sa | 26 | | M | 26 | 52 |
| W | 27 | | Sa | 27 | | Tu | 27 | Wind Energy Basic - Generalists | Th | 27 | Wind Energy Basic - Offshore | Su | 27 | | Tu | 27 | |
| Th | 28 | | Su | 28 | | W | 28 | Wind Energy Basic - Generalists | F | 28 | | M | 28 | 48 | W | 28 | |
| F | 29 | | M | 29 | 35 | Th | 29 | Wind Energy Basic - Generalists | Sa | 29 | | Tu | 29 | | Th | 29 | |
| Sa | 30 | | Tu | 30 | | F | 30 | | Su | 30 | | W | 30 | | F | 30 | |
| Su | 31 | | W | 31 | | | | | M | 31 | 44 | | | | Sa | 31 | |



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# 2011 Testimonials from previous participants

Marika Räisänen, Training Manager
WinWind, Finland
"While focusing on your area of expertise, it's also important to have an overall understanding of wind energy technology and business. DUWET's basic course offers a good starting point for building up this knowledge. A large amount of information is given during the two-day course".

Aart van der Pal
ECN, Petten, The Netherlands
"Nice, well organized course. Broad perspective presented which give good overview. Professional instructors from Danish Industry. Good decision to join course".

Luis Bustamante
DONG Energy, Denmark
"Excellent course overall! Thanks. Very impressive mix of Speakers ".

Casper Kann
DONG Energy, Denmark
"Very good course with great learning for me".

Hans Vestergaard, Sales Manager
Vestas Offshore Ltd.
"I am very pleased with the outcome of the introduction course. It was a very good way to be introduced to the terms of the wind power business. It gave me a quick overview and enabled me to be running at full speed on the job immediately".


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The DUWET cooperation is operated and managed by the Institute of Business and Technology at the University of Aarhus.

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