A day with C++11

C++11 represents a major upgrade of C++. The standard has increased by approximately 30 %. There are a lot of new advanced features but also a lot of simplifications and more expressive constructs for easing daily life programming.
The major news in C++11 will be presented and accompanied by small hand-on exercises

Contents
The topics of the day will be
➔ uniform initializations
➔ enum classes
➔ tuple – a new "quick and dirty" data structure
➔ user-defined literal constants
➔ auto declaration of variables
➔ the new easy range for-loop
➔ memory-leak prevention with unique_ptr, shared_ptr and weak_ptr
➔ constexpr functions (compile-time functions)
➔ lambda functions
➔ polymorphic function object wrapper
➔ functions with variable number of parameters
➔ new keywords for more precise control over the class inheritance hierarchy
➔ new "right-side" reference variable Rvalue reference T&&
➔ move constructors and move-assignments
➔ variadic templates (templates with variable number of parameters)
➔ type-traits for acquiring type details on run-time static assertions (for debugging and verification)
➔ some of the news in the standard library
➔ C++14 wraps up the loose ends from C++11

Audience
The course is addressed to skilled professional programmers knowing about C++ in advance.

Søren Top holds a master degree in computer science and a Ph.D. in software technology. He has taught engineer students advanced programming for decades.

Time and place
20. January 2015
The course is held at University of Southern Denmark, Sønderborg campus

Price
3.000 kr. excl. VAT
The price includes tuition, materials and meals during the course days. The price does not include accommodation.

Registration
Deadline 12. December 2014
On our website: www.sdu.dk/sdue

SYDDANSKUNIVERSITET**.DK**

From C to C++

This course takes a practical approach. The aim is to deliver C++ programming skills to the participants and not to convey all the details of C++. The pedagogical style is live interactive coding either on the blackboard or using a projector. This will constitute half of the time and the other half will be used for programming exercises at a computer.

Contents
The course topics of the 3 days will be
➔ C++ as a better C.
➔ Classes and objects.
➔ Operator overloading
➔ Inheritance.
➔ Polymorphism
➔ Exceptions
➔ Templates
➔ Introduction to the Standard Template Library (STL)
➔ Introduction to the new C++11 features

Audience
The course is addressed to skilled professional programmers with a background in the C programming language. Familiarity with the programming language C is required and expected.

Søren Top holds a master degree in computer science and a Ph.D. in software technology. He has taught engineer students advanced programming for decades.

Time and place
21.-23. January 2015
The course is held at University of Southern Denmark, Sønderborg campus

Price
9.000 kr. excl. VAT
The price includes tuition, materials and meals during the course days. The price does not include accommodation.

Registration
Deadline 12. December 2014
On our website: www.sdu.dk/sdue

Contact
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  tlf. 6550 1640, mail: duggen@mci.sdu.dk

❚ Consultant Mathias M. Jensen
  tlf. 6550 1073, mail: matj@sdu.dk

Learn more on www.sdu.dk/sdue

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Hands-on Android

Ever wondered how to unleash the computing power of your phone or tablet? How can we use such devices to talk to our own developed hardware? How hard is to make a sensor monitoring app or an app that can control an actuator remotely?

This course takes advantage of modern and unique high technology facilities located at campus Sønderborg of SDU to provide a thorough hands-on introduction to practical Android application development by addressing:
➜ Basics of Android programming
➜ Activities and background services
➜ Implementing wireless communication (Bluetooth / WiFi)
➜ Powerful user interfaces: charting tools for sensors, use of touch screen or internal sensors for remote control of external hardware

The aim is to give an overview and a crash hands-on course of how we use Android to make powerful apps to serve the development of third party hardware and be ahead of the curve in user interaction. The course was developed by researchers of the Mads Clausen Institute.

Benefits
On the course you will receive:
➜ A Google Asus Nexus 7 tablet ready for your first app
➜ An overview of Android: what is it all about?
➜ Knowledge about object oriented programming
➜ Knowledge about key concepts in Android: activities, services, intents and broadcast receivers
➜ Knowledge about wireless communication
➜ Easy to understand examples for all the important concepts
➜ Individual assistance for developing your own app
➜ Opportunity to exchange experiences and network with colleagues

Audience
The course content is addressed to skilled professionals working in different industrial sectors related to hardware/software, home automation or smart sensor/actuator development.

Knowledge of either C/C++/Java programming language and an understanding of object oriented programming concepts, corresponding to a bachelor, civil engineer, professions bachelor or similar is expected.

Time and place
21.-23. January 2015
The course is held at University of Southern Denmark, Sønderborg campus

Price
9.000 kr. excl. VAT
The price includes tuition, materials and meals during the course days. The tablet will be yours after the course. The price does not include accommodation.

Registration
Deadline 12. December 2014
On our website: www.sdu.dk/sdue

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Program

Day 1 Morning: Introduction to Android
➔ Introduction to Android and Object Oriented Programming
➔ Practical session: Writing and testing your first app

Day 1 Afternoon: Key Concepts in Android
➔ Activities and intents
➔ Practical session: Adding key concepts to your first app

Day 2 Morning: Charting
➔ Charting tools
➔ Practical session: Using the Achart Engine to display internal sensor data

Day 2 Afternoon: Services
➔ Background services and broadcast receivers
➔ Practical session: Build an app with service/activity interaction

Day 3 Morning: Communication
➔ Bluetooth and Wireless Communication
➔ Practical session: Implementing simple Bluetooth/WiFi communication on the tablet

Day 3 Afternoon: Hands-on App development
➔ Practical session: Build an app that can read external sensors
➔ Practical session: Build an app that can control external actuators

Alin Drimus is Assistant Professor in Mechatronics, with experience in Embedded Design and Android App Development at the Mads Clausen Institute, University of Southern Denmark.

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Hands-on Microtechnology

How can modern microtechnology help to cover the ever increasing demands and result in better and competitive products?

This course takes advantage of one of the most modern and unique high technology facilities located at campus Sønderborg of SDU to provide a thorough hands-on introduction to novel and emerging micro technologies covering areas such as:

➜ Sensor development
➜ Microstructured surfaces
➜ Power MEMS

The aim is to give an overview and a hands-on understanding on upcoming micro- technologies that are used in production and development facilities worldwide. The course was developed by researchers of the Mads Clausen Institute in collaboration with external partners such as the Fraunhofer Institute ISIT in Germany.

Benefits
On the course you will receive:

➜ A broad overview on modern microtechnological methods and techniques

➜ Knowledge on microminiaturized sensors

➜ Knowledge on power microelectromechanical systems

➜ Knowledge and experience on structure formation of smart surfaces

➜ Access to a pool of broad scientific and engineering expertise

➜ Opportunity to exchange experiences and network with colleagues

Audience
The course content is addressed to skilled professionals working in different industrial sectors such as sensor development, advanced electronics, microscaled mechatronics or similar.

Basic knowledge of engineering and/or physics corresponding to a bachelor, civil engineer, professions bachelor or similar is expected.

Time and place
22.-23. January 2015
The course is held at University of Southern Denmark, Sønderborg campus

Price
6.000 kr. excl. VAT
The price includes tuition, materials and meals during the course days. The price does not include accommodation.

Registration
Deadline 12. December 2014
On our website: www.sdu.dk/sdue

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Program

Day 1 Morning:
Microfabrication and -characterization
➜ Introduction to microtechnology
➜ Thin-film deposition
➜ Etching
➜ Scanning electron microscopy and scanning
   probe microscopy

Day 1 Afternoon:
Hands-on Microstructures
Practical cleanroom exercises
➜ Lithography
➜ Thin-film deposition
➜ Microscopy

Day 2 Morning:
Micro-Electro-Mechanical Systems and power MEMS
➜ Introduction to MEMS sensors and actuators
➜ Types of actuation and sensing
➜ Materials and fabrication
➜ Power MEMS
➜ MEMS switches and power electronics
➜ Bio-applications

Day 2 Afternoon:
Hands-on MEMS
➜ Background services and broadcast receivers
➜ Practical session: Build an app with service/activity
   interaction

Jakob Kjelstrup-Hansen is Associate Professor at the Nanoscience Center NanoSYD at the Mads Clausen Institute, University of Southern Denmark.

ISIT / Roana Melina de Oliveira Hansen is Assistant Professor both at the Mechatronics department and the Nanoscience Center NanoSYD at the Mads Clausen Institute, University of Southern Denmark.

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Learn more on www.sdu.dk/sdue

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Hands-on Photovoltaics

How to address the major challenges in the society related to energy, climate and environment?
Photovoltaics is besides wind- and bioenergy one of the most important sources for renewable energy generation.

This course takes advantage of modern and unique high technology facilities located at campus Sønderborg of SDU to provide a thorough hands-on introduction to promises, possibilities and boundaries of modern photovoltaics. Areas covered include:

➜ Direct generation of energy from solar light
➜ Photovoltaic systems
➜ Inverter technology: conversion towards the common grid

The aim is to give an overview and a hands-on understanding on present and upcoming photovoltaics technologies that are used for delocalized power production in, e.g., smart phones, on the roof of common households and for production of large current in solar power plants. The course was developed by researchers of the Mads Clausen Institute in collaboration with external partners.

Benefits
On the course you will receive:

➜ A broad overview of photovoltaic technology
➜ Knowledge about first, second and third generation solar cells
➜ Knowledge about inverters for photovoltaic installations
➜ Knowledge and experience in setting up complete photo voltaic systems
➜ Access to a pool of broad scientific and engineering expertise
➜ Opportunity to exchange experiences and network with colleagues

Audience
The course content is addressed to skilled professionals working in different industrial sectors related to energy generation, renewable energies or energy conversion.

Basic knowledge of engineering and/or physics corresponding to a bachelor, civil engineer, professions bachelor or similar is expected.

Time and place
22.-23. August 2015
The course is held at University of Southern Denmark, Sønderborg campus

Price
6.000 kr. excl. VAT
The price includes tuition, materials and meals during the course days. The price does not include accommodation.

Registration
Deadline 12. December 2014
On our website: www.sdu.dk/sdue

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Program

Day 1 Morning: Photovoltaics: from Silicon to organic solar cells
➜ How do solar cells work
• The physics behind solar cells
• Loss processes and limitations
• Characterization of solar cells
• From standard Silicon to thin-film devices

Day 1 Afternoon:
Hands-on on Solar Cells

Day 2 Morning: Photovoltaic Systems
➜ PV plant topologies
• Micro grid systems
• String inverters based systems
• Central inverters based systems
➜ The concept of shadows
➜ Annual energy production scenarios

Day 2 Afternoon: Hands-on PV Systems

Morten Madsen is Associate Professor at the Nanoscience Center NanoSYD at the Mads Clausen Institute, University of Southern Denmark.

Kasper Paasch is project leader of 'SUNRISE', a photovoltaics project at the Mads Clausen Institute, funded by the region South Denmark.

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Learn more on www.sdu.dk/sdue

International Intellectual Property
a practical introduction

Although everybody deals with Intellectual Property every day, many people neither recognize it as such nor do they understand even the basics of Intellectual Property Rights. But everybody who is working in an innovation-oriented field, e.g. in engineering or life science, has sooner or later to deal with at least the IP rights of others. And facing IP rights of a competitor in a conflict situation can cause inconvenient results if the IP rights and their implications are not understood correctly. Furthermore, for a newly developed product for which maybe high financial risks were taken- IP rights are essential in order to secure the benefits from that product for the developing firm.

This course shall give you by means of many examples:
➜ a basic understanding of Intellectual Property,
➜ a basic understanding of Patents, Trademarks and Designs,
➜ an overview on international IP issues and possibilities,
➜ help on how to handle new developments / inventions and
➜ on how to deal with the IP of others.

Throughout the course you will learn theoretically and in workshops the basics for handling your IP or the IP rights of others. This course will make it easier for you to evaluate the IP rights of others and to find the best way for protecting your own.

A German script and the Slides comprising the main aspects of this course will be available as handout and/or download.

Audience
The course content is addressed to skilled professionals working in different industrial sectors.

No basic knowledge is expected for participants of this course.

Material for sessions will be provided.

Time and place
22.-23. January 2015
The course is held at University of Southern Denmark, Sønderborg campus

Price
6.000 kr. excl. VAT
The price includes tuition, materials and meals during the course days.
Price does not include accommodation.

Registration
Deadline 12. December 2014
On our website: www.sdu.dk/sdue

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Program

Day 1
➜ What is intellectual property and why do we need it?
➜ Intellectual property rights vs. copyrights
➜ The different kinds of intellectual property rights (overview)
➜ Patents and inventions
➜ Utility models
➜ Who is the owner of an innovation?

Day 2
➜ Designs
➜ Trademarks
➜ International IP
➜ How to handle intellectual property rights in conflict situations

There will be workshops throughout the course to experience, to learn and to overcome the difficulties of IP issues using real or realistic case scenarios. Actual cases of attendees of the course are welcome to be discussed as long as no confidentiality conflicts arise.

Contact

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❚ Consultant Mathias M. Jensen
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Learn more on www.sdu.dk/sdue

Carl-Philipp Clarenbach has almost 10 years of experience in the field of intellectual property (IP). He received his diploma in mechanical Engineering in 2005, the same year he started his IP work for the law firm of Gleiss & Große in Stuttgart, Germany. Since then he has consulted and represented German and international, large and medium-sized enterprises as well as university and commercial research institutes. After being trained he was admitted both as a German Patent Attorney and as a European Patent Trademark and Design Attorney in 2009 and became a partner of Gleiss & Große in 2012. To deepen his knowledge and understanding of international aspects he further studied European Intellectual Property Laws, becoming a Master of Laws (LL.M.) in 2013.

He is admitted at the German Patent- and Trademark Office (DPMA), the German Federal Patent Court (BPatG), the European Patent Office (EPO) and the HABM. He is also admitted at the German Federal Supreme Court (BGH) in connection with nullity actions, proceedings concerning supplementary protection certificates and compulsory licenses. He is also admitted at Federal Bureau for Protection and National Listing of New Plant Varieties.

In addition, since 2013 he has a teaching assignment from the Steinbeis School of International Business and Entrepreneurship (SIBE). And he gives guest lectures at the Friedrich-Alexander University Nürnberg.

Introduction to embedded Linux

Embedded Linux has grown to one of the most preferred operating systems for embedded system designs and numerous companies have adapted it for their products. It is an open-source, rich featured and robust operating system for embedded systems.

However, getting started with an embedded Linux based embedded design can be a challenging and time consuming task for those who have not previously developed in embedded Linux. Secondly it is difficult to grasp all the advantages and features of embedded Linux and get an overview about hardware requirements for custom designed embedded Linux systems.

This workshop is designed for developers with embedded C experience who would like to get an insight into the development based on embedded Linux from a practical point of view. An introduction is given about what is needed to develop and run an embedded Linux system on a 32-bit processor. The basic concept of the Linux kernel and its main components will be introduced as well as embedded Linux application and kernel module (driver) development.

A critical issue in embedded systems design is the energy efficiency and the power management, therefore the power management framework of the Linux kernel will be introduced as well as power debugging techniques for software optimization targeting the energy efficiency of developed code and the Linux kernel processes itself. Real power consumption will be measured and correlated to software execution to make code and the custom kernel run more energy efficient.

Each course attendee will be given a development kit based on an ARM processor; additionally each attendee will get an energy probe for power debugging. 50% of the course is practical hands-on exercises which are designed generic so that they can be used as a platform for custom embedded Linux projects. Development hardware kits will be provided which can be taken home after the course.

Benefits
On the course you will receive:

➜ An insight into embedded Linux and key kernel components

➜ Setup and use of a cross platform development system

➜ Knowledge about application development based on embedded Linux

➜ Knowledge about peripheral interfacing through kernel modules (drivers)

➜ Knowledge about power management and code correlated power debugging

➜ Hands-on experience with embedded Linux development

Contact
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Learn more on www.sdu.dk/sdue

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Program

Day 1 Lecture
➜ Introduction to embedded Linux (Kernel concept and architecture, Virtual memory and memory manager, Hardware abstraction layer, Scheduler, File Systems, I/O subsystem, Device driver (kernel module) concepts, User- versus kernel space, Kernel configuration)
➜ Hardware requirements to run an embedded Linux kernel (Processor architecture, Memory management, Storage, Periphery)
➜ Linux start-up sequence and Boot loader (Busybox integration)

Hands-on session
➜ Introduction to the development kit
➜ Setup of a cross platform development and tool chain
➜ Interfacing of an I2C sensor in user-space

Day 2 Lecture
➜ Linux device drivers
➜ Time, Interrupts and Concurrency
➜ Kernel debugging techniques

Hands-on session
➜ Development of a device driver for DC motor control

Day 3 Lecture
➜ Power management in the Linux kernel
➜ Kernel Energy efficiency and power probing techniques
➜ In-system power consumption probing to determine power efficiency of code

Hands-on session
➜ Implementation of a power consumption probing framework for the given hardware and embedded Linux kernel

Robert Brehm is project leader and R&D Engineer for embedded control systems at the Mads Clausen Institute, University of Southern Denmark.

Audience
The course content is addressed to skilled professionals working in different industrial sectors related to embedded systems. It is intended for those who would like to become familiar with the tools and techniques used in developing based on an embedded Linux system.

Basic embedded programming (preferable C) skills corresponding to a bachelor, civil engineer, professions bachelor or similar are expected

Time and place
21.-23. January 2015
The course is held at University of Southern Denmark, Sønderborg campus

Price
9.000 kr. excl. VAT
The price includes tuition, materials (Embedded Linux development kit) and meals during the course days. The price does not include accommodation.

Registration
Deadline 12. December 2014
On our website: www.sdu.dk/sdue

Multiphysics Finite Elements

Multiphysics problems are more and more commonplace in engineering. A very typical area for this is electromechanics, where the coupled nature of the electrical and mechanical parts is the driving mechanism, which is the case for e.g. piezoelectric devices and electric machinery. Another area is electrical components where electrical effects are strongly connected to heating effects and heat transfer for the cooling of the components. Due to the coupling of physics, it becomes more difficult to design devices from simple guidelines and formulas. This is where simulation software, specifically Finite Element Methods (FEM) has its strength.

This course is given as an introduction into the fundamental concepts of multiphysics modelling and its application in Finite Element Software.
Areas covered include:
➜ The concept of elements
➜ Boundary and coupling conditions
➜ Convergence

The aim is to give a thorough understanding of FEM, its abilities and pitfalls. This includes a brief example of solving a simple FEM in Matlab and evaluation of results from commercial software. In this course, both Ansys and Comsol Multiphysics can be used as FEM software, noting that the lecturers are mostly experiences with Comsol Multiphysics.
The course was developed by researchers of the Mads Clausen Institute.

Benefits
On the course you will receive:
➜ A solid fundamental knowledge of the principles behind FEM
➜ Mechanisms of solving Multiphysics problems in general and FEM
➜ Guidance for using commercial FEM software like Ansys and Comsol
➜ Knowledge about evaluating FEM results
➜ Knowledge of commonly used FEM numerical solvers
➜ Opportunity to exchange experiences and network with colleagues

Audience
The course content is addressed to skilled professionals working in different industrial sectors.
Basic knowledge of engineering and/or physics corresponding to a bachelor, civil engineer, professions bachelor or similar is expected. Knowledge of programming in Matlab or other mathematical software is recommended. More specifically, the participant is expected to understand and be able to perform
➜ Integration of polynomials
➜ Basic differentiation
➜ Matrix multiplication/determinants

Time and place
21.-23. January 2015
The course is held at University of Southern Denmark, Sønderborg campus

Price
9.000 kr. excl. VAT
The price includes tuition, materials and meals during the course days.
The price does not include accommodation.

Registration
Deadline 12. December 2014
On our website: www.sdu.dk/sdue

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Program

Day 1 Morning:
Intoduction to Finite Element Methods
➔ Refreshing Ordinary and Partial Differential Equations
➔ The concept of Elements
➔ Residual and Weak Formulation
➔ Exercise with a 1D problem

Day 1 Afternoon: Boundary Conditions
➔ Boundary Conditions general and in FEM
➔ Introduction to multiphysics
➔ Exercise with a 1D multiphysics problem

Day 2 Morning: Convergence
➔ Concept of convergence
➔ How to check for convergence
➔ Exercise with 2D problem

Day 2 Afternoon: Hands on Multiphysics Problem
➔ 2D or 3D multiphysics problem
• Heat and mechanical coupling
• Electrical Machines

Day 3 Morning: Solvers
➔ Direct Solvers – Gauss elimination and variants
➔ Interative Solvers
• Steepest Decent
• Conjugate Gradient
• Multigrid Methods
➔ Convergence for time dependent problems

Day 3 Afternoon: Starting up your problem type
➔ Getting started on real problems from participants
➔ Optional predefined problems

Benny Lassen is Associate Professor in Mathematical Modelling at the Mads Clausen Institute, University of Southern Denmark.

Lars Duggen is Assistant Professor in Mathematical Modelling at the Mads Clausen Institute, University of Southern Denmark.

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Power Electronics

The increasing need for more efficient energy usage has boosted the importance of power electronics in recent years. Along with great potential for energy savings comes a set of challenges.

This course gives a unique insight into several new and important aspects of power electronics. One day will cover the use of wide-bandgap semiconductors in power electronic application, while the other day will concern Electromagnetic Compatibility (EMC).

The aim is to give an overview and a hands-on understanding on these two issues that are projected to become more prominent in future product development. The course was developed by researchers of the Mads Clausen Institute in collaboration with external partners such as the Fraunhofer Institute ISIT in Germany and DELTA in Denmark.

Benefits

On the course you will receive:

➜ A broad overview on Physics of Semiconductors used in Electronic and Power Electronic Devices

➜ Knowledge on Wide Bandgap Semiconductors used in Power Electronics

➜ Knowledge on EMI and EMC issues

➜ Access to a pool of broad scientific and engineering expertise

➜ Opportunity to exchange experiences and network with colleagues

Audience

The course content is addressed to skilled professionals working in different industrial sectors such as power electronics, advanced electronics and/or mechatronics, microtechnologies or similar.

Basic knowledge of engineering and/or physics corresponding to a bachelor, civil engineer, professions bachelor or similar is expected.

Time and place

22.-23. January 2015
The course is held at University of Southern Denmark, Sønderborg campus

Price

6.000 kr. excl. VAT
The price includes tuition, materials and meals during the course days. The price does not include accommodation.

Registration

Deadline 12. December 2014
On our website: www.sdu.dk/sdue

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Program

Day 1 Morning:
Introduction to Physics of Semiconductors and Power Devices
➜ Energy bands and forbidden gaps
➜ Charge carriers, generation and recombination, density of
  states, doping
➜ Transport properties, semiconductors under
  non-equilibrium, junctions
➜ Devices and power devices

Day 1 Afternoon:
Wide-bandgap devices compared to silicon devices
➜ Wide-bandgap devices, transistor and diode structures up
  to 1200V, differences to silicon devices
➜ Improvements in static and dynamic device performance
➜ Advantages in dedicated converter applications
➜ Reliability topics

Day 2 Morning: EMI and EMC
➜ Introduction to EMC
➜ Standards for regulatory compliance in EU
➜ Radiated and conducted emission
➜ Radiated and conducted immunity
➜ Burst, surge, flicker, harmonics and ESD

Day 2 Afternoon: Hands-on EMC
➜ EMC HALT
➜ Design reviews – what to look for in pcb design
➜ A low cost Pre-compliance toolbox
➜ Troubleshooting with near-field probes

Prof. Dr. Ing. Holger Kapels is Professor at the Hamburg University of Applied Sciences where he is leading research projects concerning powerelectronic systems for use in the renewable energy sector.

Anders P. Mynster is an EMC and EMC & wireless specialist at DELTA. Where he has guided electronic developers through EMC problems and wireless designs

Prof. Stefan Mátéfi-Tempfli is Professor at the Mads Clausen Institute of the University of Southern Denmark where he is leading the Mechatronics group

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Learn more on www.sdu.dk/sdue

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TRIZ Level 1 Certification
- Theory of Inventive Problem Solving

You have a technical problem you could not solve before? For this, TRIZ may offer you the right toolset for coming up with new solutions based on contradictions (Mann, 2001):

TRIZ (Theory of Inventive Problem Solving, also called TIPS) is the science of creativity derived from all scientific and engineering solutions. It is a problem solving toolkit, based on one of the biggest studies on creativity with over 1.500 person years of research, and has studied over two million of the world`s most successful patents.

TRIZ is intended to complement and add structure to our natural creativity rather than replacing it. So it is about providing means for problem solvers to access the good solutions obtained by inventive minds. Hence, it is a creativity method dedicated for technical problems.

Several international companies such as Samsung, Intel, General Electric or Siemens are already using the concept and certification of the International TRIZ Association MA TRIZ.

Participants of this course who successfully pass the test at the third day, will receive the MA TRIZ Level 1 Certificate!

Benefits
On the course you will receive:
➜ An overview of the TRIZ background
➜ Know-how about TRIZ tools & methods
➜ Opportunities to apply TRIZ in groups
➜ Knowledge how to formulate a problem
➜ Experience to form a group for TRIZ application
➜ Opportunity to receive a Level 1 Certificate
➜ Basis for future application and further education on TRIZ

Audience
The course content is addressed to skilled professionals working in different industrial sectors.
No basic knowledge is expected for participants of this course. The group size is limited to a maximum of 16 participants.

This offer is an ideal combination with the course on Creativity Techniques.

Time and place
21.-23. January 2015
The course is held at University of Southern Denmark, Sønderborg campus

Price
9.000 kr. excl. VAT
The price includes tuition, materials and meals during the course days.
The price does not include accommodation.

Registration
Deadline 12. December 2014
On our website: www.sdu.dk/sdue

SYDDANSKUNIVERSITET**.DK**

Program

Day 1

➜ TRIZ Overview of tools & methods
➜ TRIZ History
➜ Introduction of "Nine Windows"
➜ Discussion rounds and group work

Day 2

➜ Theory and Application of Root Cause Analysis
➜ Introduction to Function Analysis & Trimming
➜ Definition of Technical & Physical Contradictions
➜ Contradiction Matrix & Separation Principles
➜ Discussion rounds and group work

Day 3

➜ Introduction to Trends of Evolution
➜ Overview of Substance-Field Analysis
➜ Discussion rounds and group work
➜ MA TRIZ Level 1 Test (120 Minutes)
➜ Individual MA TRIZ Level 1 Certification

Alexander Brem is Professor of Technology & Innovation Management as well as Head of the Innovation & Business Group at the Mads Clausen Institute (MCI), University of Southern Denmark. He received his Diploma in Business Administration in 2004, and his Ph.D. in Innovation & Entrepreneurship in 2007. He is a successful Entrepreneur with the foundation of two companies, and gained many years of industry experience in the context of SME`s. His research is focused on the management of technology and innovation, with a special focus on creativity.

Jens Hammer is project manager at 'Siemens' and PhD Student at the Friedrich-Alexander-Universität Erlangen-Nürnberg. He is member of TRIZ Campus, MA TRIZ Level 3 and has the accreditation for MA TRIZ-Level 1 trainings. He received his Diploma in Mechanical Engineering 2010, and his M.Sc. in Industrial Engineering in 2013.

Contact
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Learn more on www.sdu.dk/sdue

SYDDANSKUNIVERSITET**.DK**

Understanding and applying Creativity Techniques

Everybody has heard about brainstorming or other creativity techniques, but most people do not apply them in the right way. If basic understanding and application are missing, there won't be successful results in creativity and idea workshops.

This course is focused on how:
➜ creativity works in general
➜ mental barriers prevent us from being creative
➜ creativity techniques can be applied
➜ creativity workshops should be planned and executed

Based on the theoretical background given in the course, all participants will have several opportunities to apply the knowledge in group works. For this, real-life topics from the participating companies are welcome to work on.

For participants of this course, a German book on creativity workshops and creativity techniques will be handed out for free.

Benefits
On the course you will receive:
➜ An overview of the scientific background of creativity
➜ Know-how about how to apply creativity techniques
➜ Opportunities to apply techniques in groups
➜ Knowledge how to formulate an appropriate question
➜ Know-how about how to organize a creativity workshop
➜ Free German book on creativity and creativity techniques (optional)

Audience
The course content is addressed to skilled professionals working in different industrial sectors. No basic knowledge is expected for participants of this course.

Material for creative sessions will be provided. This offer is an ideal combination with the course on TRIZ.

Time and place
22.-23. January 2015
The course is held at University of Southern Denmark, Sønderborg campus

Price
6.000 kr. excl. VAT
The price includes tuition, materials and meals during the course days. The price does not include accommodation.

Registration
Deadline 12. December 2014
On our website: www.sdu.dk/sdue

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Program

Day 1

➜ How does creativity work?
➜ Can creativity be learned and measured?
➜ Mental barriers preventing being creative
➜ Overview of how creativity techniques work
➜ Introduction to main creativity techniques

Day 2

➜ Ideal structure of a creativity workshop
➜ Development of a good workshop question
➜ Critical success factors of creativity workshops
➜ Application and combination of creativity techniques

For each part of the workshop, there will be opportunities to work in groups in order to apply the knowledge. For this, participants may bring their own problems, ideas or questions.

Alexander Brem is Professor of Technology & Innovation Management as well as Head of the Innovation & Business Group at the Mads Clausen Institute (MCI), University of Southern Denmark. He received his Diploma in Business Administration in 2004, and his Ph.D. in Innovation & Entrepreneurship in 2007. He is a successful Entrepreneur with the foundation of two companies, and gained many years of industry experience in the context of SME`s. His research is focused on the management of technology and innovation, with a special focus on creativity.

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