Course Portfolio

Disciplines

1. Analog and Digital Electronics
2. IC Design and Technology
3. EMC, ESD, Signal Integrity, Power Integrity
4. Thermal Design
5. Low Power
6. Digital Signal Processing
7. Tools
8. Optics
9. Personal skills

Course contents

Technical Training for Professionals (T2Prof)
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The High Tech Institute (HTI)
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1. **Analog and Digital Electronics**
   
   1. **DAE Design of Analog Electronics** (for PCB or IC design, 5 modules)
      1. **DAE-INTRO**, Introduction to electronic processing and analysis techniques
         (only in-company)
      2. **DAE-AE1**, Embedded analog electronics 1
      3. **DAE-AE2**, Embedded analog electronics 2
      4. **DAE-IC**, Analog IC Design
      5. **DAE-RF-IC**, RF IC Design (only in-company)
   
   2. **Digital System and Circuit Design**
      1. **ENE-BEAE**, Electronics for Non-Electronic engineers - Basics Electricity and Analog Electronics
      2. **ENE-BDE**, Electronics for Non-Electronic engineers - Basics Digital Electronics
      3. **PBD – FPGA**, Platform-Based Design with FPGAs (on request)
   
   3. **Power electronics**
      1. **D-SMPS**, Design of Switch Mode Power Supplies (new)

2. **IC Design and Technology**
   
   1. **CMOS-BASIC**, Nanometer CMOS ICs – Basics
   2. **CMOS-FULL**, Nanometer CMOS ICs – The Full Picture (only in-company)
   3. **BoC**, Bits on Chips – an Introduction
   4. **IC-PDP**, IC Physics Devices and Processing
   5. **MEMS**, Micro Electro Mechanical Systems

3. **EMC, ESD, Signal Integrity, Power Integrity**
   
   1. **EMC-DT**, Electro Magnetic Compatibility - Design Techniques
   2. **EMC-ME**, EMC course for Mechatronic Engineers (new)
   3. **SI-WS**, Signal Integrity Workshop
   4. **PI-PD**, Power Integrity for Product Designers (new)

4. **Thermal Design**
   
   1. **CoE**, Thermal Design and Cooling of Electronics Workshop

5. **Low Power**
   
   1. **ULP**, Ultra Low Power (new)

6. **Digital Signal Processing**
   
   1. **DTSP**, Discrete-Time Signal Processing
   2. **DIGMOD-B**, Digital Modulation Basics (on request)

7. **Tools**
   
   1. **LABVIEW**, LabVIEW 1: Introduction in Language and Programming
   2. **LABPROG**, LabVIEW 2: Programming in LabVIEW
   3. **LABPROJECT**, LabVIEW 3: Developing a large Labview application

8. **Optics**
   
   1. **AP-OPT**, Applied Optics
   2. **CMOP**, Modern Optics for Optical Designers

9. **Personal skills**
   
   1. **6HATS**, Six Thinking Hats
   2. **LATH**, Lateral Thinking
   3. **SIMPL**, Simplicity (on request)
   4. **POWER-P**, Power of Perception (on request)
   5. **NETW**, Networking
Course teasers

1. **6HATS** Six Thinking Hats - Thinking constructively as an alternative for arguing. 2 days.
3. **BoC** Bits on Chips – An Introduction – A one-day introduction into the basics of (CMOS) Integrated Circuits (Chips), their complexity, operation, possibilities and limitations. For people with little or no knowledge of Chips, active in the semiconductor industry in disciplines like management, marketing - sales and software development, who want to improve the communication with their technical colleagues. 1 day.
5. **CMOS-BASIC** Nanometer CMOS ICs - Basics – A 3-day tutorial on the development of CMOS ICs. For engineers working in electronic product development and engineering, who have to write and read IC specifications, test samples, discuss technical details with suppliers and customers, etc. and for others who need a thorough understanding of ICs.
6. **CMOS-FULL** Nanometer CMOS ICs – The Full Picture – A 5-day comprehensive course on the operation, development and production of CMOS ICs. For engineers employed in IC - research, - design, - modeling, - technology development, - CAD development, - test development, - product engineering, - failure analysis, - reliability engineering or - packaging. It is offered only as an in-company course.
7. **CoE** Thermal Design and Cooling of Electronics Workshop - Introductory course on thermal design and cooling of electronic components, modules and systems, both for experienced and non-experienced electronic and mechanical engineers. 3 days.
8. **DAE-INTRO** Design of Analog Electronics – module Introduction to electronic signal processing and analysis techniques – One module of a curriculum on the design of analog electronics. The curriculum stands out from the main stream by the methodical and design-oriented approach, which targets an industrial environment. The advantages of this approach are: Predictable results, Controllable design route and First-time right. This module gives insight into the complexity of designing electronic information processing systems, making designers become productive earlier, take up less time of experienced colleagues and use an identical and effective design approach. 5 days, lectures, practical training, home-work and final assignment. It is offered only as an in-company course.
9. **DAE-AE-1** Design of Analog Electronics – module Embedded Analog Electronics 1 – One module of a curriculum on the design of analog electronics. The curriculum stands out from the main stream by the methodical and design-oriented approach, which targets an industrial environment. The advantages of this approach are: Predictable results, Controllable design route and First-time right. This module learns to specify and design the most essential basic functions (amplifiers and analog level shifts) for interfacing with sensors, actuators, AD and DA converters. It also refreshes, broadens and learns to apply analysis techniques. 8 days, lectures, practical training, home-work and final assignment.
10. **DAE-AE2** Design of Analog Electronics – module Embedded Analog Electronics 2 - One module of a curriculum on the design of analog electronics. The curriculum stands out from the main stream by the methodical and design-oriented approach, which targets an industrial environment. The advantages of this approach are: Predictable results, Controllable design route and First-time right. This module learns to apply, specify and design analog functions that are often required in embedded systems. The functions discussed in this module are: power switches, digital level shifts, active and passive filters, networks for impedance matching and – correction, single-bit AD converters, and AD and DA converters (selection and application only). 5 days, lectures, practical training, home-work, assignment.
11. **DAE-IC** Design of Analog Electronics – module Analog IC Design - One module of a curriculum on the design of analog electronics. The curriculum stands out from the main
stream by the methodical and design-oriented approach, which targets an industrial environment. The advantages of this approach are: Predictable results. Controllable design route and First-time right. This module learns to specify and design an analog integrated circuit comprising an application-specific amplifier and/or DC reference; 11 days, lectures, practical training, home-work, assignment.

12. **DAE-RF-IC** Design of Analog Electronics – module RF IC Design - One module of a curriculum on the design of analog electronics. The curriculum stands out from the main stream by the methodical and design-oriented approach, which targets an industrial environment. The advantages of this approach are: Predictable results. Controllable design route and First-time right. This module deals with the design of analog integrated circuit transceivers in BICMOS technology; 9 days, lectures, practical training, home-work and final assignment. It is offered only as an in-company course.

13. **DIGMOD-B** Digital Modulation Basics - A practical course on digital modulation methods as used in cable, terrestrial and satellite applications (radio, TV, mobile/portable applications, internet, …). 3 days.

14. **D-SMPS** Design of Switch Mode Power Supplies - The course discusses the design of switch mode power supplies, general topologies, components of power circuits, switching devices and (integrated) control circuits. The topologies discussed are used for applications up to approximately 300 W. 15 evening lessons.


16. **EMC-DT** ElectroMagnetic Compatibility - Design Techniques - Introductory course on electromagnetic emission and susceptibility in products and systems: problems, analysis methods, measures. 5 days.

17. **EMC-ME** EMC course for mechatronic engineers - Introductory course for mechatronic and mechanical engineers on electromagnetic emission and susceptibility. The ME engineer needs to know what kind of EMC problems can occur. He should be able to communicate with the electronic engineer to understand the EMC requirements and how he can take care that the mechanical design obeys the EMC requirements. 1 day.

18. **ENE-BDE** Electronics for Non-Electronic engineers - Basics Digital Electronics - A comprehensive course for non-electronic engineers to gain insight, practical knowledge and skills in digital electronics, essential to work in projects together with electronic engineers. 13 Evening lessons of 3 or 4 (in case of hands-on) hours. Excluding one test.

19. **ENE-BEAE** Electronics for Non-Electronic engineers - Basics Electricity and Analog Electronics - A comprehensive course for non-electronic engineers to gain insight, practical knowledge and skills in electricity and analogue electronics, essential to work in projects together with electronic engineers. 22 Evening lessons of 3 or 4 (in case of hands-on) hours. Excluding three tests.

20. **IC-PDP** IC-Physics Devices and Processing - Comprehensive course to learn the basics of semiconductor physics, devices and processing. Process flow, semiconductor devices and device physics, MOS and bipolar IC processing, process control monitoring. 12 weekly sessions of 1 evening, incl. homework.

21. **LABPROG** LabVIEW 2: Programming in LabVIEW - A 2-days advanced LabVIEW programming course to extend your programming skills. Learn building Graphical User Interfaces, communicating with other applications and creating practical architectures.

22. **LABPROJECT** LabVIEW 3: Developing a large Labview application. A 3-days LabVIEW programming course to develop scalable, readable and maintainable LabVIEW applications, and to define, design, implement, test and deploy these LabVIEW applications.

23. **LABVIEW** LabVIEW 1: Introduction in Language and Programming - A 3-days comprehensive course to learn the basics of LabVIEW, a graphical programming environment by pictograph, for performing measurements, data acquisition, analysis and graphical presentation of information.

24. **LATH** Lateral Thinking, guided creative thinking - Practical training about lateral or 'out of the box' thinking and generating a spectacular number of new ideas in a structured way. 2 days.

25. **MEMS** Micro Electro Mechanical Systems - Introductory course on theory, design and application of Micro ElectroMechanical Systems. 3 days.
26. **NETW** Networking – An interactive course on building and maintaining a successful network. 1 day.

27. **PBD – FPGA**, Platform-Based Design with FPGAs - A design methodology aiming at quickly realizing a complex design by interconnecting IP blocks is called platform-based design. Platform-based design is supported by tools that take care of instantiating IP blocks with the right parameters and interconnecting them automatically. It can be used for the design of a system-on-chip (SoC) aiming to fabricate new silicon. Or, it can target to exploit the large number of gates available on an FPGA, in which case the design becomes a system-on-programmable-chip (SoPC). The concepts involved are illustrated by means of Altera's Qsys system which primarily builds systems around the NIOS II processor. 2 days.

28. **PI-PD** Power Integrity for Product Designers - Electronic systems show increasing speed, power dissipation and density. The design, manufacture and simulation of a Power Distribution Network (PDN) for such systems become an increasing design challenge. The allowed noise on signals and power supply rails decreases and the density and bandwidth of interconnections increases. This means that the design of a power distribution network is not independent anymore from the Signal Integrity and Electro Magnetic Compatibility (EMC) design domains. Power distribution design therefore becomes an important condition for good signal integrity and electromagnetic compatibility. 2 days.

29. **POWER-P** Power of Perception – Do you question whether the decision has been sufficiently thought through? Perception largely defines our way of thinking. With a wider view we are able to contemplate important decisions and actions in a more structured way in order to make a better well-considered decision. The Power of Perception course teaches you to improve your insight in the implications of a decision and to assess alternatives. The PoP method structures how situations are defined, the decision-making process and how action plans are drawn up. 2 days.

30. **SI-WS** Signal Integrity Workshop - As systems get faster, signal integrity may become a problem. In this workshop, for electronic designers and board lay-outers, the theory behind signal integrity is explained, practical problems are modeled and simulated, solutions are discussed. 2.5 days.

31. **SIMPL** Simplicity - A product or service that doesn't do what you want it to do, a process that bogs you down? In the Simplicity course you will learn how to simplify things and bring back to the basics. You will learn how you can put an end to ingrained habits that are no longer effective, how to avoid duplication of tasks to be performed, how to minimize whatever is unnecessary and how to challenge the entire organization to improve, to innovate and to conquer barriers. The tool is applicable both for new products, services and processes but also for existing ones.2 days.

32. **ULP** Ultra Low Power - This workshop identifies factors that influence energy consumption, explores energy related features of two energy aware MCU families, shows how to model and measure energy consumption, provides an overview of available energy measurement tooling, provides an overview how to reduce the energy footprint and provides hands-on sessions to anchor the obtained knowledge. 2 days.