MASTERS 25

EMPOWERING INNOVATION

European Conference Event Guide

www.microchip.com/en-us/education/masters

MICROCHIP'S MASTERs CONFERENCE

25 years of technical training

Welcome to the 6th European MASTERs Conference! Our goal is that after this week you will be equipped to go out and use Microchip products to their full advantage, while in turn helping to make your business even more successful. Learn, network and enjoy your week at MASTERs.

What's Included in the Conference Fee?

- Conference meals, conference classes & digital class material
- Digital Certificate upon completion
- Discounted development tools
- Meals include Lunch/Dinner Tuesday, October 28th & Wednesday, October 29th. Lunch Thursday, October 30th.

Cost

€513 + Vat
Early Bird Registration
Ends August 15th

€570 + Vat
Standard Registration

**See website for Cancellation, Refund and Transfer Policy*

Available Discount Pricing

Alumni - 12% (not stackable) registration option

Group - Cost Varies
Must be from the same company

Special Requirements

If you have any special dietary requirements or access requirements then please let us know when you register on this website, or as soon as possible thereafter with an email to masters.conference@microchip.com. We will do our best to accommodate your needs.

Microchip On-site Office

Have questions about registration, schedules, evening events or classroom locations? Whatever you can't find on our website can be answered by our friendly staff located around the conference or in our on-site Microchip office. Our staff is waiting to help you make the most of your MASTERs Conference experience.

MicrochipDirect

Microchip offers a wide selection of the most popular development tools at discounted prices for MASTERs attendees during the Conference.

Microchip University

We will ensure that class materials, including laboratory manuals, are made accessible in a restricted MASTERs catalog prior to the conference to facilitate your preparation for attendance. It is recommended that you carry a printed copy of the lab manual for the courses you intend to register for.

Waiver

Microchip reserves the right to refuse registration or entry to anyone for any reason. Microchip is dedicated to providing a friendly and educational conference experience for everyone.

Photography Waiver

Microchip may elect to take photographs or video of people and events during the MASTERs Conference. By attending this MASTERs Conference, you agree to permit Microchip to use your likeness in these photos and videos in furtherance of its business. This Release indicates that you agree that Microchip shall be the copyright owner of the photographs and video and may use and publish these photographs/videos. Microchip is released from any and all claims and causes of action that you may have now or in the future based upon or in connection with the photographs/videos and Microchip's use of the photographs/videos in any manner. All rights granted to Microchip by you in this Release are irrevocable and perpetual. You waive all rights to any equitable relief in connection with this Release and the subject matter of this Release.

CONFERENCE AGENDA

REGISTRATION & TRAINING

Monday, October 27th, 2025

Registration	17:00 - 19:00

Tuesday, October 28th, 2025

Registration	07:00 - 08:30
Class Session 1 & 2	08:30 - 12:00
Lunch & Keynote Speech by Matthias Kaestner	12:00 - 13:30
Class Session 3 & 4	13:30 - 17:00
Dinner / Offsite Evening Activity	17:00 - 21:00

Wednesday, October 29th, 2025

Class Session 5 & 6	08:30 - 12:00
Lunch	12:00 - 13:30
Class Session 7 & 8	13:30 - 17:00
Dinner/Onsite Expert Evening	17:00 - 21:00

Thursday, October 30th, 2025

Class Session 9 &10	08:30 - 12:00
Lunch	12:00 - 13:30
Class Session 11 & 12	13:30 - 17:00

EVENING EVENTS

October 28th

Our welcome dinner event will take place Tuesday, October 28 at 17:00 at La Raza Puerto Sevilla

Restaurant website: La Raza Puerto Sevilla

Shuttles will be provided to/from the restaurant.

October 29th - Experts Evening

Located onsite at the Meliá Sevilla

During the Experts Evening, Microchip experts will be available to answer your questions. Attendees can explore demos featuring the latest technologies, discuss design integration and receive tailored advice on hardware, software and development tools — from microcontrollers and analog devices to connectivity solutions. Our experts are ready to help, whether you're troubleshooting, brainstorming or optimizing. The interactive setup encourages fresh thinking and practical problem-solving, while also offering an excellent opportunity to network and share ideas. You'll walk away with real-world insights to drive your projects forward.

LOCATION

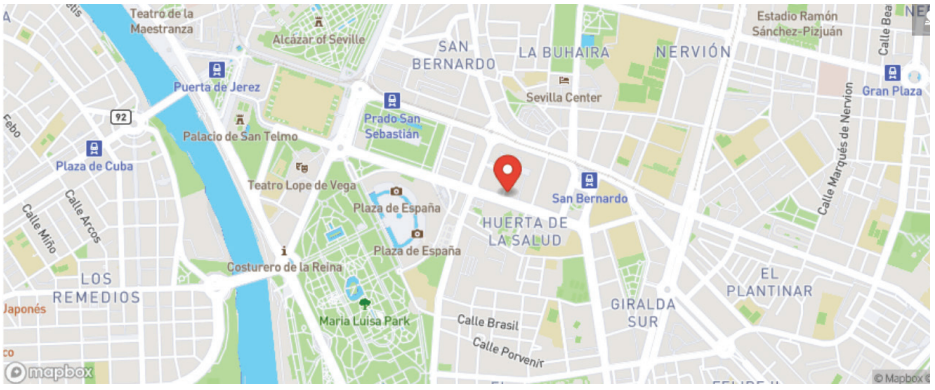
Seville, Spain

Location

This event will be held at Meliá Sevilla
1 Calle Doctor Pedro de Castro
Sevilla, 41004 Spain
Tel: +34 954 421 511

https://www.melia.com/en

The Meliá is next to María Luisa Park, and you can walk to Seville Cathedral and the Alcázar in around 15 minutes.



Discover Seville: Where Cultures Meet and Legends Are Filmed

- Seville, capital of Andalusia, is a city shaped by centuries of cultural exchange. Founded as the Roman city of Hispalis and later a major port for Spain's transatlantic empire, it reflects layers of Roman, Islamic, Jewish, and Christian heritage in its architecture, food, and traditions.

- Its historic core features three UNESCO World Heritage sites: the vast Gothic Cathedral (home to the tomb of Christopher Columbus), the colonial Archive of the Indies, and the stunning Real Alcázar palace, famously used as a filming location for Game of Thrones.

- Seville has also played a starring role in cinema. The Plaza de España, built for the 1929 Ibero-American Exposition, appeared as the planet Naboo in Star Wars: Episode II. Nearby, María Luisa Park and the modern Setas de Sevilla highlight the city's blend of history and innovation.

- Visitors can enjoy flamenco, tapas, and local craftsmanship while wandering through lively streets and timeless courtyards. In Seville, every corner tells a story—and many have made it to the screen.

- Seville is known as "Spain's Space City" and hosts key aerospace companies as well as the Spanish Space Agency (Agencia Espacial Española, AEE) headquarters.

Explore Seville: Helpful Links for Activities and Attractions:

https://travel.usnews.com/Seville_Spain/Things_To_Do/

https://www.tripadvisor.com/Attraction_Products-g187443-a_contentId.1185273702200860+268262755-Seville_Province_of_Seville_Andalucia.html

https://thesevilleguide.com/best-things-to-do-in-seville-spain/

https://www.thecrazytourist.com/15-best-things-seville-spain/

2025 MASTERs CONFERENCE CLASS LIST

Class	Title	Abstract	Time Slots	Tech Level	Type	Prerequisites
Products and Solutions						
25002 PNS2	Microchip Is... Analog, Power, Silicon Carbide, Discrete, Timing and Power over Ethernet Products	Obtain an overview of Microchip's latest analog, power, silicon carbide, discrete, and timing products. Attendees will acquire a broad understanding of our latest products across multiple technological domains and a high-level insight into potential integration opportunities and applications in their projects.	1.5	1	Presentation Only	None
Microcontrollers and Microprocessors						
25004 MCU1	Getting Started with PIC32C ans SAM Arm® Cortex® M Microcontrollers	Do you want to be able to develop proof-of-concept designs using Arm® 32-bit microcontrollers in less than one day? This class will enable you to quickly get started with embedded development using the Microchip Arm® Cortex® M0+, M23, M4 and M33 microcontrollers. This class covers much of the PIC32C and SAM system architecture which includes communication buses, the clocking system, clock synchronization, interrupts, and port control. This is not a comprehensive in-depth Arm® core architecture class, but many architecture basics will be covered. You will start from the ground-up with code development and learn how to access the device registers. The MPLAB® Harmony Configurator (MHC) will be used with the MPLAB® X Integrated Development Environment (IDE) to easily set up the microcontroller for complete operation to blink an LED with interrupts. You will also debug your code using a Curiosity Nano Evaluation board. The labs are instructor led and hands-on for all attendees.	3.5	3	Presentation with Hands-on Labs	"Prior experience using C embedded microcontrollers is beneficial. Basic microcontroller architecture knowledge."
25006 MCU3	Configurable Logic Block Part 1 - Harnessing the Power of Programmable Logic in PIC® Microcontrollers	Enhance your applications by integrating complex logic designs using the Configurable Logic Block (CLB) on PIC® microcontrollers. You will explore the CLB architecture, including Look-Up Tables (LUTs), interconnections, sequential logic, storage elements, and clocking. Additionally, you will learn to use the CLB Logic configuration tool, including schematic capture, library elements, and circuit hierarchy.	1.5	3	Presentation Only	Prior experience with MPLAB® X Integrated Development Environment (IDE) and basic knowledge of combinatorial and sequential logic is beneficial.
25007 MCU4	Configurable Logic Block Part 2 - Advanced Applications and Labs	Advance your skills with the Configurable Logic Block (CLB) through hands-on labs that cover a variety of applications. In this class, you will use the CLB to create logic circuits which implement the WS2812B LED protocol and biphase serial communication protocol. You will gain proficiency in using schematic tools, library elements, and hierarchical design through practical exercises. Additionally, you will use Verilog code to configure the CLB for one of the labs in this class. The Verilog code will be provided to you, and the Verilog language will not be taught in the class. You don't need any prior experience with Verilog to attend this class.	1.5	3	Presentation with Hands-on Labs	"Prior experience with MPLAB X IDE programming debugging, using C for embedded microcontrollers, and basic knowledge of combinatorial and sequential logic is beneficial. It is recommended that attendees have experience with the CLB module but is not required to attend this class."

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25008 MCU5	Analog MCU Cookbook: Unlocking the Power of Integrated Analog Peripherals	This class explores the benefits of using integrated analog peripherals in microcontroller units (MCUs) compared to traditional discrete analog components. In this class you will learn how integrated analog solutions can improve real-time performance, improve run-time flexibility, reduce costs, and simplify coding through Core Independent Peripherals (CIPs). In the hands-on labs you will implement an automated signal acquisition chain using dual integrated op amps, an ADC, the Configurable Custom Logic peripheral, and the Event System. You will use the Curiosity Nano development platform, MPLAB® X Integrated Development Environment (IDE) and the MPLAB® Code Configurator (MCC) to quickly and easily develop effective analog systems.	3.5	3	Presentation with Hands-on Labs	Prior experience with MPLAB X IDE programming debugging, using C for embedded microcontrollers, and basic knowledge of op amp theory and ADCs is beneficial.
25009 MCU6	Low-Power Design with Microchip's Arm® Cortex® Microcontrollers: Essential Techniques	Learn essential techniques for low power applications design with Microchip's Arm® Cortex® microcontrollers including sleep modes, automatic clock request systems, power domains / regulator selection, and inter-peripheral communication/ triggering using the event system. In the hands-on labs in this class, you will start with an active mode light sensor application example (no low power techniques utilized) and use MPLAB® Code Configurator (MCC) and MPLAB® Harmony to progressively apply microcontroller sleep modes, power management systems, and peripheral automation of tasks to reduce the power consumption. At each step along the way you will measure and observe the reduction in power consumption obtained from utilizing each low power technique.	3.5	3	Presentation with Hands-on Labs	Prior experience with embedded systems development MPLAB X IDE, using C for embedded microcontrollers, and use MCC and MPLAB Harmony is beneficial.
25010 MCU7	Exploring the Power of Microchip's new 32-bit Digital Signal Controllers: Architecture and Peripheral Overview	This class introduces the architecture, core, peripherals, and features of the dsPIC33A family of microcontrollers. You will learn about the dsPIC33A architecture including the 32-bit core, instruction set, interrupt latency, and clocking schemes. You will explore select peripherals including the 40 MSPS ADC, double precision hardware floating point unit, and high resolution PWM. This class will demonstrate the power of the dsPIC33A core and peripherals in the acquisition of an input signal produced by a signal generator and subsequent processing of the signal data on the dsPIC33A using fixed and floating point FFT's.	1.5	3	Presentation Only	Prior experience with embedded systems development and basic understanding of microcontroller architecture i
25011 MCU8	PIC64: The Master of Real-Time	Do you have real time safety and time critical task constraints but also want to run Linux®? Come along and find out about Microchip's PIC64 RISC-V® multi-core MPUs where Linux meets real time with asymmetric multiprocessing! This course will introduce the PIC64GX SoC architecture, quell any fears about RISC-V and show you how you can run a fully-fledged OS alongside a real time operating system all on one device to bring determinism to a non-deterministic world.	1.5	3	Presentation Only	Prior experience with microcontrollers and Linux is beneficial but not required.
Field Programmable Gate Array						
25012 FPGA1	Getting Started with Microchip FPGAs	This class is designed for engineers who are new to FPGAs. You will gain an understanding of what FPGAs are, examine the fundamental components of Microchip FPGA architecture, and evaluate the unique advantages of Microchip FPGAs. By the end of the class, you will have a comprehensive understanding of FPGA architecture, design flow, and development tools. You will be equipped with the knowledge to start incorporating Microchip FPGA designs into your projects.	1.5	1	Presentation Only	None

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25015 FPGA4	Introduction to SmartHLS High-Level Synthesis Compiler	This class introduces Microchip's High-Level Synthesis compiler (SmartHLS™), which demonstrates how to convert C/C++ code into Verilog code raising the FPGA design abstraction to C/C++ code level. This class also demonstrates the process of integrating SmartHLS generated blocks into the FPGA design flow, shows the features of SmartHLS pragmas and built-in C++ libraries and verify functionality and analyze system performance. By the end of the class, you will gain the skills to verify functionality and analyze the performance of your designs, expedite your design cycle by leveraging the capabilities of the SmartHLS compiler.	3.5	1	Presentation with Hands-on Labs	No prior knowledge of High-Level Synthesis is needed; however, basic understanding of FPGA design
25017 FPGA6	Designing an Application for non-FPGA Engineers using LiberoSOC Design Tools	This would walk a designer not familiar with FPGAs through the development process and have them communicate through a terminal program and some LEDs or another output to show that control is possible within the time frame of the class. The end results of the class are to expose non-FPGA designers to the capabilities and possibilities of designing with LiberoSOC and the ability to try concepts without a lot of huge time sync for developing the hardware for prototyping.	3.5	2	Presentation with Hands-on Labs	None
25018 FPGA7	Simulation and Hardware Debugging for FPGA Designs	The class covers foundational knowledge and provides practical experience in FPGA simulation flows and hardware debugging techniques. The class includes a high-level introduction to Microchip® FPGA architecture, various simulation flows, testbench generation, and hands-on labs for both simulation and debugging. For simulation flow, the Seimens® QuestaSim™ simulation tool will be used. For debugging, the Microchip SmartDebug and Synopsys® Identify® debug tools will be used. The class shows the use of simulation and debug tools within the Microchip Libero® SoC design tool flow and provides additional resources for further learning.	3.5	2	Presentation with Hands-on Labs	Students should be familiar with the Libero FPGA design tool flow
Development Tools						
25019 DEV1	MPLAB Extensions for VS Code	This course introduces attendees to the MPLAB® Extensions for VS Code®, offering a familiar development environment for existing VS Code users. Participants will gain hands-on experience with the MPLAB Extensions for VS Code, learn how to download and install the extensions, create new projects using the project wizard, and build and program their projects on a development board. The class will also cover debugging techniques for running targets and introduce the MPLAB® AI Coding Assistant. At the end of the course, attendees will have the foundational skills to efficiently develop, program, and debug embedded applications using MPLAB Extensions in VS Code.	3.5	2	Presentation with Hands-on Labs	Knowledge of embedded C programming.

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Firmware Design and Compilers						
25022 FRM3	Build Better Prototypes in Less Time with MCC Melody	Are you finding it challenging to integrate example snippets into your application or struggling with overly complex examples? Or the opposite, you have a basic structure of your application in place, so can't use any blocking code? This class will teach you how to quickly build application functionality using MPLAB® Code Configurator (MCC) Melody Example Components. You'll get an overview of MCC Melody Design Patterns for Control Flow and learn how to find and use the related Example Components and code snippets effectively. Through a hands-on example application, you will see how various building blocks can be combined to create more complex and interesting functionality. This class is ideal for those who want to streamline their prototyping process.	3.5	3	Presentation with Hands-on Labs	Basic MPLAB® X Integrated Development Environment (IDE) usage and familiarity with C code
25024 FRM5	Designing Hardware Independent APIs for Embedded Systems	This class teaches you how to create hardware independent APIs for seamless interaction across diverse hardware. You will learn to create hardware-independent APIs via the use of object-oriented principles implemented in C, and generic hardware communication drivers. By the end of the session, you will improve portability, maintainability, and scalability of your embedded design, reduce development time and simplify integration.	3.5	3	Presentation with Hands-on Labs	Previous hands-on working experience programming in C language is necessary
25025 FRM6	Mastering GUI Design with Microchip Graphics Suite	This course is designed for developers and designers aiming to advance their skills in graphics development using the Microchip Graphics Suite (MGS). Participants will delve into the MGS Composer, exploring its features and functionalities, and learn how to import a design from Figma and debug the application using the MGS Simulator. The course includes practical exercises on generating GUI simulations in both Web and Native modes and deploying GUI designs onto the SAMA7D65 Curiosity board. By the end of the course, participants will have a thorough understanding of the MGS Composer and Simulator, practical experience in GUI design and simulation, and the skills to deploy their designs onto hardware.	3.5	2	Presentation with Hands-on Labs	C Programming and MPLAB® X Integrated Development Environment (IDE)
25026 FRM7	Microchip Device Firmware Update Ecosystem	Embedded system designs frequently require a method for updating microcontroller firmware via standard communication buses such as UART, I2C, SPI, and others. Often, these bootloader methods are considered late in the design process. Fortunately, Microchip has developed a complete firmware update ecosystem including a host and bootloader clients that are easy to integrate with your project. This enables system designers to address bootloader design and implementation in a cohesive and straightforward manner. This class will provide an overview of the Microchip Device Firmware Update Ecosystem. In the hands-on labs you will create a combined bootloader/application project and use the Microchip Device Firmware Update (MDFU) host to update the client processor with a new application.	1.5	3	Presentation with Hands-on Labs	Prior experience with MPLAB® X Integrated Development Environment (IDE) and using C for embedded microcontrollers is beneficial.

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Linux						
25027 LNX1	Custom Linux® Hardware Integration	In this hands-on class, students will learn how to integrate a custom hardware design into a Linux image. The class will focus on making necessary modifications to bootloaders, the Linux® kernel, and the device tree, as well as build system integration. Using a Microchip evaluation board, students will simulate a custom microprocessor design and various boot scenarios. By the end of the class, attendees will be able to support custom hardware and adapt the boot process to their application requirements.	3.5	3	Presentation with Hands-on Labs	Familiarity working with the Linux command line and prior knowledge of embedded Linux
25028 LNX2	Custom Linux® Hardware Integration	Linux solutions are all about building complex applications by the seamless use of the rich Linux® operating system. The question then arises about how best to architect your system and begin development in this complex world. In this class, you will create a distribution for your chosen platform and install it on the hardware. This will include creating appropriate cross-compiling tool chains. You will configure VS Code® for program editing and use it to debug a remotely executing application on the target hardware. By the end of this session, you will be able to discuss the fundamental precepts of Linux application structure and decide upon an effective system architecture for your application.	3.5	2	Presentation with Hands-on Labs	Basic knowledge of Linux and basic Linux shell commands
25029 LNX3	Developing Asymmetric Multi-Processing (AMP) Systems with Linux® and Zephyr®	In this class, you will create an Asymmetric Multi-Processing (AMP) system with specified cores dedicated to Linux and an alternative OS (Zephyr®). You will discuss the use of various booting models, create an application in Linux® that responds to real-time events from the Zephyr subsystem, and explore communication across domains. By the end of the session, you will implement an AMP system with Linux and Zephyr.	3.5	4	Presentation with Hands-on Labs	An understanding of Linux shell commands as well as Polarfire® /RISC-V®/ PIC64 architecture would be useful. A basic understanding of Zephyr would be useful as well.
Artificial Intelligence/Machine Learning						
25030 AIML1	Shining a Light on AIML: An Introduction to Machine Learning	This class introduces the MPLAB® Machine Learning Development tool. You will conduct a complete machine learning workflow, identify and extract relevant features from time-variant signals, and deploy a trained machine learning model onto hardware. By the end of the session, you will create a useful real-world implementation using the ML development suite, from data collection to realtime testing and validation.	3.5	2	Presentation with Hands-on Labs	This is a beginner class on AI/ML and only requires attendees to have an understanding of the C programming language and MPLAB® X Integrated Development Environment (IDE). In addition, you will need your MyMicrochip login credentials.
25031 AIML2	Dynamic logging with sensor fusion on multiple edges with Stream Analyze Engine	Dynamic logging of sensor data is often a first step to servitization and implementing predictive maintenance. In this class you will develop an analytical model to dynamically log sensor data from an accelerometer and weather sensor. You will use the Stream Analyze Engine platform to develop, interactively test and deploy the model to the edge. As a final step, it will be demonstrated how a model can be deployed to all participants' edges at once. This course will guide you to develop models directly on the edge and deploy models to large fleets of edge nodes without the need for firmware updates.	3.5	1	Presentation with Hands-on Labs	None

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25033 AIML4	Easy Computer Vision with MPUs and Edge Impulse	This training program provides a comprehensive, Hands-On learning experience in developing machine learning applications using the SAMA7D65 and the Edge Impulse platform. Participants will cover the entire development lifecycle, including data collection, labeling, preprocessing, model training, optimization, and deployment on edge devices. Special emphasis will be placed on leveraging Edge Impulse's FOMO object detection architecture to develop high-performance machine learning applications. At the end of the course, attendees will have practical insights into the architecture and capabilities of the 32-bit MPUs and advanced techniques for maintaining and updating machine learning applications.	3.5	3	Presentation with Hands-on Labs	None
Real Time Operating Systems						
25036 RTOS2	Using Zephyr® RTOS on Microchip MCUs	Zephyr® OS is an open source RTOS targeted towards embedded systems that includes community support for many Microchip development boards. This class will introduce an engineer to the coding environment, SDK, and debug tools available within the Zephyr OS Ecosystem. Using hands-on examples, the engineer will gain experience with useful OS primitives and tasks, explore the hardware Device Tree, build and deploy to target hardware.	3.5	2	Presentation with Hands-on Labs	Familiarity with the C programming language, including functions and pointers.
25037 RTOS3	Building Zephyr® Applications Using State Machine Framework	This class will guide you through the Zephyr® State Machine Framework, focusing on its architecture, core components, and efficient design of state-driven systems. You will implement state machines using Zephyr's APIs, managing states and event-driven transitions within embedded systems. The course will also cover the best practices for optimizing state machine performance and reliability in real-time, resource-constrained environments. By the end of the class, you will be able to develop and execute state machines for multi-threaded or single-thread applications on an MCU.	3.5	3	Presentation with Hands-on Labs	Familiarity with the Zephyr RTOS environment
Analog and Mixed Signal						
25038 ANG1	Reduce noise and improve analog precision Using MPLAB® Mindi™ Simulator	In this class, you will delve into signal conditioning to enhance analog system accuracy and precision using the MPLAB® Mindi™ Analog Simulator. You will evaluate and select optimal signal conditioning topologies, gaining practical experience in filtering, amplification, and noise evaluation. The course will cover critical parameters influencing application performance and how to optimize designs. You will also create and utilize sensor models within application circuits to process sensor data and convert it into the digital domain. By the end of the class, you will be equipped to make informed design decisions, improving analog system performance and reliability.	3.5	3	Presentation with Hands-on Labs	Basic understanding of analog design concepts
Signal Integrity and PCB Design						
25041 PCB1	Optimizing PCB Layout fo Noise Reduction	This class unravels the mystery of noise reduction and its impact on embedded systems design, with particular emphasis on microcontroller-based applications. This class will help you analyze the fundamentals of EMI emissions and susceptibility and evaluate the effects of noise in your designs. The effects of noise on microcontrollers and circuit performance are presented and demonstrated through case studies and live demos. A series of progressively improved board designs will be presented to demonstrate the effects of noise reduction techniques. By the end of this session, you will be able to apply best practices in designing a PCB, including hardware and software techniques which can be used to help avoid and/or resolve real world EMC problems.	1.5	3	Presentation with instructor-led demo	Prior experience with embedded system hardware design is beneficial

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25043 PCB3	What really is EMI and How do I Tackle it? Part 1	This class will introduce you to the fundamental principles of EMI/EMC and their impact on your final design. You will explore the crucial steps of pre-compliance testing and learn to evaluate test results before going to an accredited test laboratory. By the end of this session, you will be familiar with standards and how to prepare for compliance testing, understand fundamental principles behind EMC/EMI, and explore sources and mechanisms of basic EMC pitfalls.	3.5	4	Presentation with instructor-led demo	Participants should have a basic understanding of power supplies and how they operate, as well as knowledge of basic concepts of PCB design and laboratory equipment operation/working principles.
25044 PCB4	What really is EMI and How do I Tackle it? Part 2	In this second and final part of the series, participants will explore filter topologies and learn how to design a filter for conducted EMC. By the end of the class, attendees will be proficient in designing basic EMC conducted filters and understanding how to carry out precompliance testing.	3.5	4	Presentation with instructor-led demo	Participants should have a basic understanding of power supplies and how they operate, as well as knowledge of basic concepts of PCB design and laboratory equipment operation/working principles.
25045 PCB5	Create Your Next proof of concept using AI within minutes	This class will enable you to quickly create proof of concept projects using commonly available development platforms like Arduino® and AI tools. You will learn to connect sensors and other mixed-signal devices (e.g., Temp sensor, ADC, DAC) to log, filter, display, and manipulate information visually on PCs. Through instructor-led demonstrations, you will observe the process of generating code for microcontroller boards using Microchip's own MPLAB® AI Coding Assistant, saving significant time. By the end of the class, you will have the knowledge to achieve working proof-of-concept results within minutes.	1.5	2	Presentation with instructor-led demo	Basic electronics knowledge and being familiar with coding
25046 PCB6	Power Delivery Network (PDN) Design: Fundamentals and Best Practices	Power Delivery Network (PDN) design is critical for ensuring stable and efficient power distribution in high-speed electronic systems. This course equips engineers with the skills to design robust PDNs, emphasizing strategic component selection, precise impedance management, and effective noise mitigation for clean power delivery. Participants will develop practical expertise in minimizing voltage drop and high-frequency noise to enhance system reliability. Designed to build proficiency in a foundational aspect of electronics engineering, this program prepares professionals to meet the rigorous demands of contemporary system design.	1.5	2	Presentation Only	Participants should possess a basic understanding of electronic components (resistors, capacitors, inductors) and circuit analysis fundamentals. Familiarity with voltage, current, and impedance concepts is recommended.
25100 PCB7	From Discovery to Production – a Modern Design Journey	Ready to see what the future of PCB design looks like? In this class, we'll take you on a fast-paced journey from early tech discovery all the way to manufacturing—showcasing powerful new tools and techniques that are reshaping how engineers design and deliver hardware. You'll get a firsthand look at AI-assisted circuit discovery, cloud-based tuning and simulation, and smart schematic and layout tools that actually predict your next move. We'll also dive into real-time supply chain insights, seamless online collaboration, and instant manufacturability checks with pricing at your fingertips. To top it off, stick around for a live Q&A with Siemens EDA experts as they unpack the Siemens/Microchip partnership and what it means for your next big project.	1.5	2	Presentation with instructor-led demo	

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25101 PCB8	Accelerating Microchip-based Power Electronics Design Using Siemens EDA Tools	Using a Microchip reference design, this presentation demonstrates how today's integrated design and verification solutions enable engineers to create more efficient PCB designs. Microchip and Siemens recognise the need for practical methods to improve efficiency and shorten development cycles. Both companies observe significant acceleration through the utilisation of validated design templates, automation, and verification. For this reason, the presentation combines best-practice circuits with comprehensive validation methods. The proposed method addresses signal integrity, power integrity, and thermal performance, demonstrating how modern PCB design flows enhance product robustness and reliability. As an example of robustness and reliability criteria, setup and hold time margins for signal integrity, Z-parameter distribution for power integrity, and turn-on and off energies for thermal performance can be examined. Typically, validation and verification methods identify issues only after a design falls out of specification. In contrast, automated design space exploration identifies potential solutions. This transforms traditional finger-pointing into a proactive engineering solution. The concept of this integrated and proactive engineering solution is illustrated through a practical Microchip example. Starting with a Microchip reference design, routing and placement changes are introduced. These changes are then verified using electromagnetic solvers. As a result, board parasitics such as resistance, inductance, capacitance and conductance are extracted and back-annotated to the schematic. This process allows verification of the board switching behaviour and accurately predicts electrical losses. After understanding the manual steps, the prepared simulation templates are used to fully automate the change and verification process, demonstrated on a placement optimisation case study to reduce switching losses.	1.5	2	Presentation with instructor-led demo	

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25102 PCB9	PCB Design and Verification for Cyber Resilience Act (CRA) Compliance	Supporting compliance with the Cyber Resilience Act (CRA) by ensuring robust security in PCB designs can be accomplished through multiple strategic functions in modern PCB design software. This is crucial due to the increased risk associated with using connected IoT devices in home, factory, shop, or energy grid applications. The key areas of these functionalities include data integrity, secure component management, secure design constraints, design for security, resilience simulation and analysis, secure collaboration, and predictive security. This presentation focuses on security-related constraints, automated checks for potential vulnerabilities, and integrating electrical and thermal simulations to ensure resiliency. For instance, built-in security constraints enable hardware designers to specify rules early in the design process, minimising vulnerabilities to cyberattacks. The presentation demonstrates how these rules enforce critical design considerations, such as clearance, routing isolation, and restricting sensitive data lines to inner layers. Especially for secure networks, constraints guarantee physical partitioning and isolation to prevent cross-coupling. This is critical, as cross-coupling can introduce vulnerabilities and data leakage. Although constraints are applied from the start, automated design verification using electromagnetic solvers and electrical checks is necessary to confirm the final design. The seamless integration of simulation solutions in modern PCB design systems provides automated verification of electrical integrity and EMC, thus ensuring the PCB layout is resilient against side-channel attacks or interference. Nets crossing gaps or splits, and those near board edges, are typical examples that modern automated checks identify and flag as potential vulnerabilities related to data paths. Similar checks will also be demonstrated for PCB grounding schemes and differential signalling, essential for cybersecurity compliance. This establishes a robust design foundation for more advanced checks, including electrical and thermal co-simulations or enhanced signal integrity checks. Thermal and electrical resilience reduce the risk of hardware-related vulnerabilities and downtimes, while advanced signal integrity checks ensure error-free signal paths. Addressing these three main areas—security constraints, automated vulnerability checks, and integrated simulation—accelerates CRA compliance, reduces design cycle time, facilitates early detection of vulnerabilities, and enhances product trust.	1.5	2	Presentation with instructor-led demo	
Clock and Timing						
25047 CLK1	Understanding Clock Technologies and Stability Metrics	In this class, you will explore various clock generation technologies, including quartz, MEMS, and atomic clocks. You will analyze the benefits of each technology and their applications in navigation, radar, and communications. You will also learn key concepts related to clock precision, such as frequency accuracy, phase noise, and Allan deviation, and understand their impact on system performance. Additionally, you will measure and interpret clock stability metrics using tools like the Microchip 53100A Phase Noise Analyzer.	1.5	1	Presentation with instructor-led demo	Participants should possess a basic understanding of electronic theory (oscillators, fourier analysis, signal power), basic physics concepts (waves & frequency), and a background in mathematics (algebra, simple derivatives and integrals, simple statistical measurements).

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Ethernet						
25049 ETH1	Fundamentals of Single Pair Ethernet Standards and their Applications	After attending this class, you will understand the important features of the Single Pair Ethernet Standards from multidrop 10BASE-T1S to point-to-point multiGigabit, and how it compares to other legacy and wired Ethernet interfaces, as well as the key design considerations for replacing legacy field bus solutions in order to realize the benefits of migrating legacy Information and Operation Technology buses to Single Pair Ethernet. This class will teach you the effects of PLCA network parameters using MPLAB® X Integrated Development Environment (IDE), microcontroller boards, and the latest LAN867x PHYs for 10BASE-T1S. Examine and explain the impact of different network configurations on the available bandwidth and communication. Discover that Single Pair Ethernet technology offers support for Precision Time Protocol, Time Sensitive Networks, Wake and Sleep, Power Over Data Line, Security, Remote Control, Advanced Diagnostics, Quality of Service and more!	3.5	2	Presentation with Hands-on Labs	Participants should have a basic understanding of Ethernet
25050 ETH2	Using Microchip Ethernet Switches to provide Deterministic, Reliable, and Scalable connectivity.	Modern communications systems have converged on using Ethernet; providing scalable bandwidth, interoperability, and cost effectiveness. Time-Sensitive Networking extends the application of Ethernet by adding determinism and reliability. This class covers the fundamentals of Ethernet switches, the differences between managed and unmanaged switches, and the benefits of managed switches. You will learn about TSN and its application, relevant standards and their role in enhancing network reliability, determinism, and scalability. The hands-on session includes a practical demonstration of configuring a TSN switch using Switchdev for VLAN and Precision Time Protocol (PTP). The final segment introduces IStaX, a switch operating system for Time-Aware Ethernet, featuring a live demo on setting up PTP and using Time-Aware Shaping (TAS) and Redundancy Protocols. By the end of the class, participants will understand Ethernet TSN standards, practical experience in configuring Microchip switches, and the ability to apply TSN features to improve network performance in industrial applications.	3.5	4	Presentation with Hands-on Labs	Participants should have a basic understanding of Ethernet
25051 ETH3	Securing Ethernet with MACsec and MACsec Key Agreement (MKA)	Are you currently using Ethernet and are wondering how to protect your data? If so, you should consider MACsec. In this class you will learn about the IEEE MACsec and IEEE MKA specifications and how they can be applied using a 10BASE-T1S network as an example. The topics will cover how MACsec works, encryption/decryption and authentication, the MACsec Key Agreement (MKA) protocol, key exchange and handshaking. Topics will be reinforced with an instructor led discussion around an in-class demo showcasing MACsec + MKA demo in a 10BASE-T1S Multi-drop setup.	3.5	2	Presentation with instructor-led demo	A basic understanding of Ethernet and Cryptography is beneficial

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25052 ETH4	The Clock is Ticking on Time Sensitive Networking	TSN (Time-Sensitive Networking) is a set of Ethernet sub-standards that aim to converge determinism, control, and robustness by extending existing Ethernet standards. This class comprehensively introduces TSN and timing. You will understand TSN Fundamentals, Benefits, and applications in industrial networks.	1.5	2	Presentation Only	Basic knowledge of Ethernet and timing is an advantage.
25053 ETH5	Introduction to EtherCAT®: Unlocking Real-Time Communication in Industrial Networks	EtherCAT® is an Ethernet-based industrial networking system known for its deterministic performance, achieving network timing jitter below 1 microsecond. It combines robustness, scalability, and cost efficiency, making it ideal for a wide range of applications beyond industrial automation. This class introduces EtherCAT technology, focusing on its architecture, network topology, real-time application examples and the hardware and software tools offered by Microchip.	1.5	2	Presentation with instructor-led demo	Basic understanding of Networking concepts and knowledge on Industrial automation
Internet of Things (IoT)						
25056 IOT1	WIFI and IOT a hands on primer	Wireless IoT is hard! Microchip's RNWF11 UART to Cloud solution simplifies cloud connectivity by providing a complete IoT attach device to your existing microcontroller. This class begins by introducing Wi-Fi® and MQTT terminology, services, features and abilities. You will then prototype a complete RNWF11 AT-Command sequence that connects securely to a local Wi-Fi® network, then creates a secure MQTT connection to a public MQTT broker. By the end of this class, you will be equipped with the knowledge and skills to prototype a variety of RNWF11 IoT connection sequences for your custom applications.	1.5	1	Presentation with Hands-On Labs	None
25057 IOT2	Simplify Your Next IoT Design with UART to Cloud controller	In this class, you will gain knowledge about MQTT-based IoT application architecture. You will prototype an RNWF11 command sequence to securely connect to an MQTT broker, then issue publish and subscribe messages to exchange data. Additionally, you will modify an existing firmware application to incorporate this command sequence as a robust state-machine driven task that implements the desired IoT functionality	1.5	2	Presentation with Hands-on Labs	Basic understanding of Wi-Fi® and IoT
25058 IOT3	Kick-Starting IoT Solutions with MicroPython	In this class, you will develop an understanding of MicroPython and how it can be used on a Microchip Wi-Fi® device. You will learn to interface with peripherals, connect to a cloud service, and use MQTT for messaging and control. By the end of the class, you will have practical experience in developing IoT solutions using MicroPython on the Microchip Wi-fi® Device.	3.5	3	Presentation with Hands-on Labs	Basic understanding of Wi-Fi® and IoT
Low Power Wireless						
25060 LPW2	Bluetooth® Low Energy (BLE) Made Easy	In this class, you will learn how to develop with the RNBD Bluetooth® Low Energy (BLE) module. You will develop a simple data application using MPLAB® Code Configurator (MCC) and drivers and create a link to a mobile application. By the end of the class, you will have practical experience that will allow you to develop BLE applications easily.	3.5	2	Presentation with Hands-on Labs	None

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25061 LPW3	Thread a hands on introduction	In this class, you will learn how to set up a wireless network using the Thread protocol. You will build a complete room network featuring a temperature sensor that communicates with a Thread co-processor device. You will use MPLAB® Code Configurator (MCC) tool for MPLAB® Harmony v3 tool to configure and develop the project and display the reported temperature data on the console. By the end of the class, you will have hands-on experience in developing Thread-based wireless networks.	3.5	3	Presentation with Hands-on Labs	None
Functional Safety						
25062 FUSA1	Introduction to Functional Safety	This class introduces functional safety principles and standards. You will understand the importance of preventing and mitigating risks associated with system failures, learn how to identify, assess, and manage risks, and understand the safety lifecycle and how to implement functional safety measures. By the end of the class, you will have a solid understanding of functional safety concepts and standards and be able to apply them in your projects.	1.5	1	Presentation Only	None
25063 FUSA2	Functional Safety Hardware Development	This technical course focuses on designing safety-critical hardware with a strong emphasis on ISO 26262. You will understand hardware safety requirements, learn best practices for ensuring safety and reliability, and explore hardware design techniques. You will also learn to use vendor-provided safety collateral to guide hardware design and leverage safety mechanisms built into devices. By the end of the course, you will be equipped with the knowledge and skills to develop safety-critical hardware that adheres to ISO 26262.	3.5	4	Presentation with Hands-on Labs	Familiarity with Functional Safety concepts and principles
25064 FUSA3	Functional Safety Software Development	"This technical course is designed to teach participants how to develop safety-critical software with a primary focus on ISO 26262. You will gain a deep understanding of software safety requirements, learn best practices for creating safety-critical systems, and explore various verification and validation techniques. The course will also highlight the importance of traceability throughout the development process. You will gain hands-on experience implementing a safety module within a larger product, covering static code analysis, unit testing, and fault injection testing to ensure software reliability and integrity. By the end of the course, you'll have the expertise to create safety-critical software that fully complies with ISO 26262 standards.	3.5	4	Presentation with Hands-on Labs	Familiarity with Functional Safety concepts and principles
Human Machine Interface						
25065 HMI1	Innovations in Capacitive touch: the challenging applications that Microchip's capacitive touch technology can enable.	In this lecture and live demo class, you will become familiar with the new use cases Microchip's proprietary touch technology that allows designers to address, such as moisture, high noise environments, and safety certification. You will learn to leverage our tools to minimize development efforts. Additionally, you will become familiar with Microchip's new turn-key parts that offer easy tuning and do not need a host driver, as well as our new I2C turnkey parts that offer an easy-to-configure host I2C driver. You will also explore new use cases for maXTouch® touch screen controllers. By the end of the class, you will be able to address challenging applications with Microchip's capacitive touch solutions.	1.5	1	Presentation with Hands-On Labs	Basic knowledge of working on projects in the MPLAB® X IDE would be helpful

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25066 HMI2	How to Easily Create Your First Capacitive Touch Project with MPLAB® Code Configurator (MCC) Melody	In this class, you will learn how to create and tune a capacitive touch project using Microchip's MCUs, MPLAB® X Integrated Development Environment (IDE), MPLAB® Code Configurator (MCC) Melody, and Data Visualizer. You will create a mutual cap touch project, add a USART driver to observe sensor response, and add an I2C driver to control the LED driver on the T10 sensor board. By the end of the class, you will have practical experience in developing capacitive touch user interfaces.	1.5	2	Presentation with Hands-on Labs	Basic knowledge of working on projects in the MPLAB X IDE would be helpful.
25068 HMI4	Implementing Capacitive Touch I2C Host Interface for MTCH2120	This class teaches how to implement the MPLAB® Code Configurator (MCC) Harmony I2C Host Driver for the MTCH2120 capacitive touch sensing controller. Participants will learn the basic architecture, commands, and capabilities of the MTCH2120, add the I2C host module to an MCC Harmony project, and modify the host interface to read and display touch sensor status.	1.5	3	Presentation with Hands-on Labs	Basic knowledge of working on projects in the MPLAB X IDE would be helpful.
25069 HMI5	Capacitive Digital Level Sensing for Liquids and more…	This class will teach you the basic theory of Microchip's Digital Level Sensing (DLS) algorithm and how it uses a dual ADC to eliminate ground shifts and electrical noise. You will become familiar with DLS sensor design and how to customize it for specific applications. You will learn how to access the libraries using SDE, open the project in MPLAB, program the solution to the PIC16LF DLS Evaluation kit, and tune the DLS algorithm. By the end of the class, you will be able to design and tune your own digital level sensing systems.	1.5	2	Presentation with instructor-led demo	Basic knowledge of working on projects in the MPLAB X IDE would be helpful.
Security						
25070 SEC1	Introduction to Cryptography: Demystifying the magic	This class will introduce you to key security concepts such as ECC256, SHA256, AES128, MAC, HMAC, CMAC, and RSA. You will learn to identify security aspects required in a design, describe methods of storage and protection of critical keys, and explain the basic principles of cryptography including authentication, hashing, and sign and verification. By the end of the class, you will have a solid understanding of cryptography and its application in secure designs.	1.5	1	Presentation Only	None
25071 SEC2	Cyber Regulations : Impact on Product Development and Business Risk	In this class, you will gain a comprehensive understanding of the growing cyber legislative landscape and the key requirements. You will enhance your knowledge of cyber product design and the features that should be implemented. Additionally, you will understand the effects of cyber risks on business and practice basic threat modeling techniques. By the end of the session, you will be equipped to analyze and apply cybersecurity principles to mitigate business risks effectively.	1.5	1	Presentation Only	None
25073 SEC4	Hands-On Security with Secure Elements and HSMs for Embedded Engineers	In this class, you will enhance your understanding of embedded security and cryptography, including the differences between the stand-alone Secure Element ATECC608 and the Hardware Security Module in the PIC32CZ8110CA90 Arm® Cortex®-M7 MCU. You will develop practical skills in implementing key security measures such as ECC key generation, AES encryption, ECDSA-based secure boot, and secure board-to-board communication. Additionally, you will learn about advanced security techniques, including the creation of X.509 certificates and TLS 1.3 secure communication using ECC keys stored in a Secure Element.	3.5	3	Presentation with Hands-on Labs	Basic understanding of cryptographic principles, e.g., by watching https://mu.microchip.com/cryptography-primer. Familiarity with development tools used for embedded systems, e.g. MPLAB® X Integrated Development Environment (IDE). Basic C coding skills.

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25074 SEC5	Mastering MCU Security: Keeping Your Firmware Safe using an HSM	In today's security-conscious world, ensuring the integrity and authenticity of firmware and updates is critical as embedded systems face an increasing number of attacks. This hands-on class provides a comprehensive deep dive into Secure Boot and Secure Firmware Update using the PIC32CKSG01 Arm® Cortex®-M4 MCU, leveraging its Hardware Security Module (HSM).	3.5	2	Presentation with Hands-on Labs	Basic understanding of microcontroller operation and C programming
25075 SEC6	Mastering MCU Security: Keeping Your Firmware Safe using an HSM	In this class, you will gain a comprehensive understanding of secure boot processes for Microchip MPU devices, focusing on securing the boot sequence and managing device provisioning. You will learn to configure and implement secure boot mechanisms to protect firmware confidentiality, integrity, and authenticity. This includes exploring cryptographic techniques such as Hashes, AES, RSA, and ECDSA to establish a root of trust and authenticate binaries. Additionally, you will engage in hands-on exercises to configure MPU devices, manage OTP memory, and encrypt and authenticate the second-stage bootloader (AT91Bootstrap). By the end of the class, you will be able to identify and mitigate security vulnerabilities, ensuring robust protection against unauthorized code execution. This class requires basic knowledge of the topic.	3.5	2	Presentation with Hands-on Labs	Attendees should have a foundational understanding of embedded systems and a basic grasp of cryptographic principles, such as encryption, decryption, and digital signature. It is recommended to watch https://mu.microchip.com/cryptography-primer as preparation to reinforce these concepts.
25076 SEC7	Firmware-Over-The-Air Update made Easy, Secure and Scalable	Master the art of secure firmware management in this comprehensive class that transforms how you approach Firmware-Over-The-Air (FOTA) updates. Dive deep into the critical challenges of device security, exploring the pitfalls of DIY firmware update strategies and the professional solutions offered by Microchip and Kudelski keySTREAM™ partnership. Participants will gain hands-on experience with the ECC608 TrustMANAGER device, learning advanced code signing techniques, global cybersecurity regulations, and scalable firmware deployment strategies. The class combines theoretical insights with a practical lab session, enabling developers to create, sign, and deploy firmware updates using state-of-the-art managed FOTA services. By the end of the session, attendees will understand the full firmware lifecycle, from development to secure deployment, and be equipped with the skills to implement robust, secure update mechanisms for embedded devices.	3.5	3	Presentation with Hands-on Labs	Basic understanding of cryptographic principles Basic C coding
25099 SEC8	Cyber Resilience Act	Designing a product to be capable of surviving in a hostile cyber environment requires many different features than a classic design. The changing cyber regulatory environment is driving new requirements for availability, authenticity, integrity and confidentiality in products. Many of these requirements, and the changes they bring to both the business and design processes bring many new challenges for embedded designers. Join us to discover how to design an embedded product to meet these new challenges including Key Management, Secure Boot, Vulnerability Management, Threat and Risk Analysis, SBoM and Threat Modeling to meet the risk based approach to cyber resilient products. Objectives: 1. Discuss Secure by Design and creating cyber resilient products 2. Detail key processes and functions required in a product 3. Discuss cyber risk assessment and threat analysis	1.5	1	Presentation Only	Basic understanding of CRA and essential requirements - best to visit Class 25071 SEC2 before

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Sensors						
25077 SENS1	Mastering Inductive Position Sensors	Get hands-on experience with a linear sensor that you can calibrate with in-person guidance and support. You will describe the sensing technology for position measurement, create a calibration curve for a selected linear position sensor, and implement a custom linear sensor design. This class will illustrate how to use the Microchip linear position library to jump-start your linear position measurement design and implementation.	3.5	2	Presentation with Hands-on Labs	Basic understanding of sensor signal acquisition and processing
25078 SENS2	Electrochemical Gas Sensors: Principles and Applications	In this class, you will gain a thorough understanding of electrochemical gas sensors, including their working principles and key components. You will learn to identify and select the necessary components for designing a circuit specifically for an electrochemical CO2 gas sensor. The class will also cover the advantages and limitations of electrochemical gas sensors in real-world applications. An instructor-led demonstration will provide hands-on experience in interfacing and measuring CO2 using these sensors. This class requires basic knowledge of the topic and will equip you with the skills to effectively design and utilize electrochemical gas sensors in various applications.	1.5	2	Presentation with instructor-led demo	Basic understanding of sensor signal acquisition and processing
25080 SENS4	Cyborg Lab 101: Signal Acquisition for Biomedical Prosthetic Devices	In this class, you will describe sensing requirements for myoelectric/EMG signals and their applications. You will design and compare different (more analog vs more digital) signal chain topologies for the myoelectric sensor signals. Additionally, you will implement the measurement of one of the signal chains and use it for ML-based signal classification with applications in biomechanical prosthetic devices.	3.5	3	Presentation with Hands-on Labs	Basic understanding of sensor signal acquisition and processing
Motor Control						
25082 MTR1	High performance motor control using low-cost MCUs	In this course, you will explore the methodologies and techniques necessary to design and implement advanced motor control solutions using affordable microcontrollers (MCUs). You will understand the motor control capabilities of low-end MCUs, learn how to use Microchip tools to achieve maximum performance, and how to tune and debug motor control systems. Through hands-on labs, you will develop robust motor control systems that meet stringent performance criteria without exceeding budget constraints.	3.5	3	Presentation with Hands-on Labs	Basic knowledge of working on projects in the MPLAB® X Integrated Development Environment (IDE) would be helpful.
25083 MTR2	Brushless motor control workshop	This class offers an extensive exploration of Brushless DC (BLDC) motor control techniques. You will learn about brushless motors, how they can be driven (block/sine/sensorless/sensor), and which Microchip tools to use for which application. Through hands-on labs, you will gain practical experience with various motor control methodologies, including forced commutation, sensored and sensorless drives, and Field Oriented Control (FOC).	3.5	3	Presentation with Hands-on Labs	Basic knowledge of MPLAB® X Integrated Development Environment (IDE) and C programming
25084 MTR3	No-Code Motor Control Solutions	This class provides an advanced exploration of motor control systems utilizing Microchip Technology's innovative tools: motorBench®, QSpin, and X2Cscope. You will learn which tools are available from Microchip, when to use which tool to spin the motor, and how to tune and debug a motor control application. Through hands-on sessions, you will engage in rapid prototyping and deployment of motor control systems, enhancing efficiency and reducing complexity.	3.5	2	Presentation with Hands-on Labs	Basic knowledge of MPLAB® X Integrated Development Environment (IDE) and C programming

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25085 MTR4	Developing Motor Control Applications using Model Based Design	This class provides a comprehensive exploration of motor control application development through model-based design methodologies. You will understand the tools and their capabilities, learn how to develop, simulate, deploy, and debug a model, and understand the advantages and disadvantages of model-based design. Using Scilab®, you will create accurate and efficient models of motor control systems, gaining insights into their behavior and performance in a virtual environment. The class will be concluded with a demonstration of a MATLAB® model.	3.5	4	Presentation with Hands-on Labs	Basic knowledge of MPLAB® X Integrated Development Environment (IDE) and C programming
Power Supplies and Power Conversion						
25089 PWR4	Fundamentals of Digital Power Supply Control	This class offers a comprehensive exploration of digital control techniques for switch-mode power supplies, designed for participants with basic knowledge of the topic. Attendees will learn to analyze the fundamental plant transfer function from both simulated circuits and existing hardware. The class will guide participants through designing a software-based digital control feedback loop using frequency domain feedback design tools and tuning the performance of an existing power converter to meet desired performance and stability parameters. Additionally, the class will explain the capabilities and limitations of discrete time domain signal generation and sampling in analog continuous time domain systems, evaluating their impact on system performance. Participants will also learn to apply the transformation process to determine compensation coefficients and modify these coefficients during runtime to achieve adaptive control behavior in power supply systems. This class will equip participants with the essential skills to implement and optimize digital control in power supply systems.	3.5	2	Presentation with instructor-led demo	Basic knowledge of switch-mode power supply fundamentals and analog control techniques
25090 PWR5	Introduction to Power Supply Applications with the new dsPIC33A Digital Signal Controller	This class will help you apply what you have learned in the fundamentals of digital power class to an actual power supply. You will analyze the dsPIC33A microcontrollers architecture, investigate specific performance improvements in power supply applications, and demonstrate practical examples of popular control techniques implemented with the dsPIC33A. Through instructor-led demos, you will gain a surface-level understanding of control theory and how to achieve desired performance in digital power applications.	3.5	2	Presentation with instructor-led demo	Basic knowledge of switch-mode power supply fundamentals, analog and digital control techniquesr
25091 PWR6	Fundamentals of Digital Power Model Based Design with MATLAB/ Simulink	This course will cover the principles and motivation behind model-based design, focusing on the integration of MATLAB® Simulink® with MPLAB® x Integrated Development Environment (IDE) tools to generate realtime C language applications. Participants will learn to utilize MATLAB/Simulink device blocksets specific to Microchip's dsPIC Digital Signal Controllers (DSCs) for developing and validating digital signal processing and control designs, from initial concept to final code. The Simulink model will be demonstrated, including the addition of blocks for code generation for Power Factor Correction (PFC) development, and the process of embedding the algorithm into the dsPIC DSC target for real-time testing will be covered. Attendees will gain knowledge in configuring and using both the Microchip and MathWorks® development environments.	3.5	3	Presentation with instructor-led demo	Previous experience with MATLAB/ Simulink is beneficial

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25093 PWR8	Multilevel AC/DC Power Supply Design Review	Since the early 1990s, multilevel topologies have been creating great interest as they promise highest power density and efficiency. Over the years, new power semiconductor technologies have been introduced and established, which now allow the cost effective application of these fascinating architectures in mass products. In this expert-level class, we will review the design of a 5.5kW AC/DC power supply comprised of a 4-level Flying Capacitor Multi-Level (FCML) Totem-Pole-Bridgeless (TTP) Power Factor Correction (PFC) stage with hold-up boost stage and a isolated 4-level LLC Resonant DC/DC Converter. The design review starts with a direct comparison between a conventional TTP PFC + LLC architecture and its 4-Level counter part, highlighting the impact on component size and circuit reduction. Specific design aspects, such as switch the node driver design and control signal distribution will be discussed, before discussing the non-linear control system implementation in detail.	1.5	4	Presentation with instructor-led demo	
25094 PWR9	Why Silicon Carbide (SiC), Why Now?	This class is designed for participants with basic knowledge of high voltage, high power applications. Attendees will explore the benefits of Silicon Carbide (SiC) compared to traditional silicon in these applications, gaining insights into the advantages of SiC technology. The class will include a comparison of power stage designs using SiC and silicon, featuring a live test to demonstrate the switching loss differences between a SiC MOSFET, Si MOSFET, and Silicon (Si) Insulated-Gate Bipolar Transistor (IGBT). Additionally, participants will learn to use the MPLAB SiC Power Simulator online tool to analyze power stages incorporating SiC MOSFETs and diodes. This class will equip participants with the knowledge and tools to effectively evaluate and implement SiC technology in high power applications.	3.5	2	Presentation with instructor-led demo	Basic knowledge of high voltage, high power applications is beneficial
USB & PCI						
25092 USB2	USB 3.0 & PCI Type-C Explained: Fundamentals, Use Cases, and Debugging	This session provides a comprehensive overview of USB 3.0 architecture, protocol, and power management, along with an introduction to USB Type-C, Power Delivery (PD), and Alternate Modes. Additionally, we will cover common software and hardware issues in USB communication and demonstrate how to analyze USB 3.0 enumeration, packet transfers, and power negotiation using a protocol analyzer. Through real-world examples, we will explore how USB 3.0 is used in various applications. We will also showcase how Microchip's USB 3.0 hubs, USB Bridges and PD controllers can be leveraged to design scalable, efficient solutions for these applications. By the end of this session, attendees will gain practical knowledge of USB 3.0 and Type-C implementation, along with debugging techniques to optimize performance and ensure seamless connectivity in real-world designs.	1.5	2	Presentation Only	"Basic Knowledge of USB Technology : Familiarity with USB 2.0 and its fundamental concepts (host, device, enumeration, endpoints)."

Level	Description
1	No prior knowledge on the topic necessary
2	Basic knowledge of the topic is necessary
3	Previous hands-on working experience with the topic is necessary
4	Thorough knowledge and working experience with the topic is necessary
5	Advanced – attendees should already have expertise in the topic before attending

2025 MASTERs CONFERENCE CLASS LIST

Class	Title	Abstract	Slots	Tech Level	Type	Prerequisites
25098 PCIE1	Fundamentals of PCIe?	Curious about PCIe technology and its role in modern computing systems? Want to learn how to debug PCIe issues efficiently using Microchip's free Chiplink tool? Interested in practical demonstrations of reliable and stable PCIe links between boards and backplanes? This 90-minute class is for you! PCIe Fundamentals Overview: Explore PCIe architecture, key features, and advantages. Understand why PCIe is essential for modern computing. How to Debug PCIe Using Microchip Free Chiplink Tools: Learn hands-on techniques to identify and troubleshoot PCIe issues using Chiplink. Enhance your debugging efficiency with practical tips and demonstrations. Practical Use Case Demo Using PCIe Between Boards, Cables and Backplanes: See real-world use cases of PCIe connecting boards with cables and backplanes. Discover how Microchip tools validate PCIe links for optimal performance and stability. By the end of this class, you'll have a solid understanding of PCIe technology, essential debugging skills, and practical applications of PCIe in real-world projects. Don't miss this opportunity to deepen your knowledge and enhance your skills! We will be available in the experts evening, come see us!	1.5	1	Presentation with instructor-led demo	None

Level	Description
1	No prior knowledge on the topic necessary
2	Basic knowledge of the topic is necessary
3	Previous hands-on working experience with the topic is necessary
4	Thorough knowledge and working experience with the topic is necessary
5	Advanced – attendees should already have expertise in the topic before attending