

# Masters 2024

TRAINING COURSE SUMMARY

 CRESTRON

2024

MASTERS



# What is the Crestron Masters Training Event?

Crestron Masters is a three-day event and continuing education program for Crestron Certified programmers, designers, and sales professionals. At this exclusive training and networking event, certified professionals come together with their peers to learn the latest and greatest in tech. Attendees are given the opportunity to get ahead in the industry and learn technology and techniques before they are released to the public.

Crestron Masters started small in 2002, with 30 programmers who traveled to Rockleigh, NJ for three days of intensive programming classes. Fast forward two decades, Crestron Masters is now globally recognized continuing education program with thousands of attendees.

Each Masters track is packed with diverse course offerings taught by the Crestron team, Diamond-level programmers, Silver-level designers, and guest partners. Crestron Masters courses are organized by track to focus on the attendees' core competency:

**Master Certified Programmers** holds the highest respect in the industry, owing to the rigorous training, extensive experience, and stringent testing throughout the certification process

**Master Technology Architects** have the skillset to design Crestron solutions properly. The MTA program challenges you to know the products, gain a deeper understanding of the technology, and apply it to designing Crestron systems.

**Master Sales Associates** are part of an exclusive community committed to selling the best, most intuitive solutions to meet customer needs. MSAs continue their education through the Modern Work Summit where they have the opportunity to network with customers and industry thought leaders.

[Learn more about Crestron Masters](#)

## General Sessions 2

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## Crestron Masters Certified Programmers

User Interface Courses 3

Programming Courses 4

Tools & Diagnostics Courses 6

---

## Crestron Masters Technology Architect

System Design Courses 7

Advanced System Design Courses 9

Intelligent Video Design Courses 12

Panel Discussions 12

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## Crestron Masters Sales Associates 13

# General Sessions

MGS-100

## Welcome Keynote

🕒 90 minutes

📺 Presentation & Livestream

Join the Crestron key executives leading the way in developing better ways of working and learning. Hear from Crestron partners and industry innovators on the new technologies that respond to the challenges and opportunities of our constantly evolving world. Solutions are designed to make organizations more intelligent, nimble, collaborative, and better positioned for what is to come.

MGS-200/-300

## Evening Event and Dinner

🕒 2.5 hours

### MGS-200: Crestron Masters & MWS Evening Event & Dinner

Tuesday night, offsite dinner reception.

### MGS-300: Crestron Masters Evening Event & Dinner

Wednesday night, onsite at the Conference Center & Partner Pavilion.

MGS-400

## Closing Session

🕒 90 minutes

📺 Presentation

In this live and exclusive Crestron Masters conference, expect to hear and see news about the following year at Crestron: Up-and-coming products, updates, services, and more! Go beyond the next 90 days of technology.

Featuring our engineering leadership team, this session will provide detailed insights and information about what you will see released within the next 12 month. We will conclude the event with recognition of this year's Crestron Masters event and introduce our newly leveled-up Crestron Masters Certified Programmers and Masters Certified Technology Architects.

HACK

## Annual Crestron Masters Hackathon

🕒 2 hours

Participate in this year's challenging and thought-provoking Crestron Masters Hackathon and push your mental limits to new heights. Make the annual Hackathon the high point of your week!

\*Open to all attendees

# Crestron Masters Certified Programmer

## User Interface Courses

MUX-421

### User Interface Creation Using Crestron Construct Software

🕒 3 hours

🏠 Lab

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**PREQ:** We recommend completing the following CTI course:

🔗 **Getting Started with Crestron Construct IDE Software**

Crestron Construct™ software was released in May 2023 and has continued to evolve into the next-generation drag-and-drop UI editing software. Join us to find out what is new and test-drive the Crestron Construct software — using it to create a basic, reusable project that you can use as the foundation for many of your projects.

#### What's new in Crestron Construct software:

- Recently added blocks and objects and show how to use the properties to make beautiful, custom user interfaces for your projects with minimal fuss
- Using contracts instead of join numbers and show how this can significantly simplify the program

MUX-521

### Elevating the UI Experience: HTML5 Development Utilizing the Crestron Library

🕒 3 hours

🏠 Lab

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**PREQ:** Basic knowledge of HTML5 and standard single-page web app frameworks. We also recommend reviewing **Typescript** tutorials.

Beyond CH5! This class will look at HTML user interface creation, with a vanilla approach combined with the CrComLib for the connection to the control system.

We will start by creating a contract and then learn how to utilize standard web frameworks to create your own user interface elements. We will focus on building a Crestron UI using the Angular and React frameworks. Together, we will build a functional user interface that you can use as a launchpad for your projects.

\*Download the **required software environment** before event begins. In addition, download and install **Angular** or **React**. Ensure that you have administrative rights to run NPM scripts.

## Programming Courses

MSP-421

### What's New in SIMPL Windows, and Creating Your First C# Library

🕒 3 hours

🏠 Lab

PREQ: None

What is new in SIMPL Windows? This class will cover some newer SIMPL Windows topics, such as adding and using Crestron drivers within SIMPL, along with a look at using contracts generated from a Crestron Construct™ User Interface project. We will then take a fresh look at migrating from SIMPL+® programming language to C#.

If you are up to date and using SIMPL+ programming language in your projects but haven't yet come to grips with C#, this class will show how to program C# libraries from the perspective of the SIMPL+ programmer.

\*Download **Microsoft Visual Studio** before event begins. Ensure you have the **latest versions** of Crestron Database, Device Database, SIMPL Windows, SIMPL + Cross Compiler, Crestron VisionTools® Pro-e (also known as VT Pro-e\*), Smart Graphics, and Crestron Toolbox.

MPG-421

### Third-Party Integration

🕒 3 hours

🏠 Lab

PREQ: Basic knowledge of C#. We also recommend completing the following CTI courses:

🔗 [First C# Program](#)

🔗 [Object-Orientated Programming \(OOP\)](#)

🔗 [Writing C# for 4-Series Processors](#)

🔗 [Using the XiO Cloud Service API](#)

Integration with third-party devices and services is an essential part of modern AV projects. Learn how to leverage both Crestron and third-party APIs to add a new dimension to your projects. In this three-hour session we will cover the use of the Microsoft® Graph API to add system usage information to calendar appointments, so that clients can use reporting to drive their future AV direction.

You will also learn how to use the Graph API to send help requests from the user interface directly to a Microsoft Teams® channel or email. Also in this class, we'll cover integration with XiO Cloud®, using the API to pull XiO Cloud technology operations management platform data into third-party applications.

\*Download **Microsoft Visual Studio** and the **.Net Framework 4.7 development tools** before event begins. Postman software will be used for initial testing.

MSS-521

## C# for Crestron System Programming

🕒 3 hours

🏠 Lab

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**PREQ:** Basic knowledge of C#. We also recommend completing the following CTI courses:

- 🔗 [First C# Program](#)
- 🔗 [Writing C# for 4-Series Processors](#)
- 🔗 [Object-Orientated Programming \(OOP\)](#)

After taking the User Interface Creation Course (MUX-421), this lab session will build the code for the same project to provide working, reusable code that can be used as a basis or starting point for future projects. Starting from a basic project, we will explore using contracts instead of join numbers. The class will show how to add and use the contract classes generated in the UI sessions within our C# code.

This session will also show how to add a Crestron driver to our program and continue to build the program code with valuable methods and techniques.

\*Download [Microsoft Visual Studio](#) and the [.Net Framework 4.7 development tools](#) before event begins

MPG-521

## Creating Crestron Drivers

🕒 3 hours

🏠 Lab

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**PREQ:** Intermediate knowledge of C#. We also recommend completing the following CTI courses:

- 🔗 [Writing C# for 4-Series Processors](#)
- 🔗 [Crestron Drivers](#)

A returning topic to the Crestron Masters conference and as important as ever, this class will go through the necessary steps to create a Crestron driver. Starting with an overview of the required C# classes and architecture, the session will create a working example of a display driver that can be used in your future projects.

We will discuss the power of Crestron drivers, the benefits they bring to simplify your code, and how they can bring third-party devices into the XiO Cloud® platform.

\*Download [Microsoft Visual Studio](#) and the [.Net Framework 4.7 development tools](#) before event begins

MSS-621/MPG-621

## Advanced Programming Concepts

🕒 3 hours

🏠 Lab

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**PREQ:** Open to attendees with a certification of Gold and above

Join us for an unparalleled learning experience in the world of Crestron programming with Toine and Yuri, two renowned experts in the field!

This advanced programming class is designed to take your skills to the next level and tackle the most challenging aspects of Crestron development. Before attending this immersive course, you will have the opportunity to submit your questions and programming problems, Toine and Yuri will personally address the most common and intriguing inquiries, providing in-depth insights and solutions

## Tools and Diagnostics Courses

### MVC-411 VC-4 Maintenance and Diagnostics

🕒 90 minutes

🎧 Lecture & Lab

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**PREQ:** We recommend completing the following CTI course:

🔗 [Getting Started with VC-4](#)

Learn the troubleshooting and diagnostics steps to enable you to maintain a VC-4 server. This class will examine server management through the Cockpit application. Find out the most common questions asked of our support team and the steps you can take to resolve them.

The class will discuss what messages to look for in the logs and what those messages mean. Get your VC-4 questions answered by Crestron Engineering!

### MTT-421 Tools & Troubleshooting

🕒 3 hours

🎧 Lecture & Lab

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**PREQ:** None

This class will go through the steps required and tools used to methodically find and fix the source of the problems to resolve onsite issues with networks, DM NVX® AV-over-IP and DM NAX™ Audio-over-IP installations, and more. We'll talk leveraging repositories for software management and version control, what methods can be used for HTML5 and C# code management, how to create and configure a GitHub repository, and how this can now be used with Crestron Construct™ software.

### MTT-521 Writing Maintainable Code and Debugging Methods

🕒 3 hours

🎧 Lecture & Lab

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**PREQ:** Intermediate knowledge of C# and Microsoft Visual Studio. We also recommend completing the following CTI courses:

🔗 [Writing C# for 4-Series Processors](#)

🔗 [Crestron Drivers](#)

When software grows in complexity, it's easy for it to become messy and hard to manage. Writing clean code is very important when it comes to adding features, fixing bugs, or involving other developers.

This session will discuss the techniques and concepts used to create clean code and find a balance between high-quality work, the time required, and the cost. We will then cover debugging tools and techniques for C# code.

# Crestron Masters Technology Architect

## System Design Courses

MNE-211

### Wireless by Design

🕒 90 minutes

🎧 Lecture, Exercises

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PREQ: None

Wireless is irrefutably finding its way into more commercial applications than ever. We'll explore this trend and discuss how to maximize success and confidence. In this course, you'll gain an understanding of the most common wireless technologies used in our technologies and how to design for success.

Topics will include 802.11g/n/ac/ax, DECT, AirMedia® Connect Adaptor, Miracast® software, AirPlay® software, antenna considerations, frequency coordination, and environmental considerations.

MGE-211

### Video Signal Extension in a USB-C World

🕒 90 minutes

🎧 Lecture, Exercises

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PREQ: None

USB-C® connectivity is rapidly emerging as the dominant personal device connectivity option. Learn how to design with the latest DM Lite® technology products that support USB-C® connectivity video, USB extension, and device charging. Take a look at how USB-C connectivity technology impacts systems designs. Learn product capabilities and limitations to produce successful designs confidently.

MDM-211

### The Future of DM and DM NVX

🕒 90 minutes

🎧 Lecture, Exercises

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PREQ: None

Take a technical, deep dive into the latest DM NVX® AV-over-IP capabilities, including DM NVX technology as software, multi-view, and a completely revamped DM NVX Director® switching appliance. Engage in practical exercises of converting conventional DM designs to DM NVX designs.



MFX-211

## Designing the Right UC for the Right Space

🕒 90 minutes

🎯 Lecture, Exercises

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PREQ: None

After briefly introducing the updated Crestron Flex Room Solutions portfolio, we'll collaborate to design the most appropriate Crestron Flex UC Solutions based on criteria such as room size, furniture layout, and desired far-end experience. We'll also take challenging RFPs into full system designs.

MGE-212

## Scalable Room Standards

🕒 90 minutes

🎯 Lecture, Exercises

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PREQ: None

Technology is reaching deeper into organizations and touching more room types than ever before. Learn the many ways designers can add value while removing complexity and installation effort. We'll design rooms that include wireless presentation + conferencing, scheduling, and zero-touch automation — modern connectivity options that may all be configured, updated, and managed at scale with a few clicks.

MNE-212

## Extending, Routing, and Switching USB Peripherals

🕒 90 minutes

🎯 Lecture, Exercises

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PREQ: None

From HID to cameras to mics, connecting devices to hosts at a distance or over the network are growing requirements. Between USB-EXT, NX2, DM NUX, DM NVX, and the all-new USB 3.2 Data Matrix Switchers, learn what works with what, its capabilities, and its limitations. Exercises will be designed around the most common use cases, including meeting rooms, higher education, and operations centers.

MAU-211

## Maximizing AVoIP Benefits with the NAX Ecosystem

🕒 90 minutes

🎧 Lecture, Exercises

PREQ: None

You know DM NVX® AV-over-IP. Meet its audio twin, DM NAX™ Audio-over-IP technology. We'll introduce the ecosystem lineup from streaming sources to Dante® audio networking, to Bluetooth® communications inputs, to amps, to network-enabled speakers.

We'll work together to design systems that work seamlessly with DM NVX, DM NUX, and even third-party audio systems.

## Advanced System Design Courses

MAU-311

## Designing Effective Speaker Systems (with EASE)

🕒 90 minutes

🎧 Lecture, Exercises

PREQ: None

Effective audio reinforcement is only as good as the designer's speaker selection and placement. In this course you will be among the first to design with all-new speaker offerings and you will learn how to use Crestron's speaker profiles within the EASE software platform.

\*Download [EASE Address – Free Download](#) and [Ease Address Database](#) before event begins

MUX-311

## Mastering the User Experience

🕒 90 minutes

🎧 Lecture, Exercises

PREQ: None

Where does the user experience begin? Where does it end? How can we help our customers "earn the commute?" In this course, you will learn how to design with human-centric principles that elevate the user's experience from before they enter the room until after they leave. Together, we will design a user's day, from room booking to room finding to thoughtful automation and effortless room controls to preparing the space for the next user.

MVC-311

## VC-4 Advanced Design

🕒 90 minutes

🎓 Lecture, Exercises

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PREQ: None

Let's take VC-4 to the next level with campus-wide server-based control. Learn how this approach challenges conventional wisdom by adding redundancy and streamlining operations and maintenance.

We will sort through everything from server and virtual machine specs (RAM and CPU allocation) to failover to licensing and room management. You will walk away with the know-how to offer this capable solution to your customers, as well as the confidence of knowing how it gets deployed.

MGE-312

## Unraveling USB-C Connectivity

🕒 90 minutes

🎓 Lecture, Exercises

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PREQ: None

With heightened user convenience usually comes a host of underlying complexities. This course will reveal all the capabilities inherent to the USB-C® connector and how to recognize which capabilities are implemented where.

We will discuss common misconceptions, industry pitfalls, and how to design to fulfill the desired user experience and expectations — including managing expectations through education.

MNE-311

## Advanced AVoIP System Design

🕒 90 minutes

🎓 Lecture, Exercises

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PREQ: None

Go beyond the single standalone switch with this dive into large multi-switch and converged network topologies, protocols, and configurations.

Upon completion of this course, you will possess a confident understanding of how multiple AVoIP technologies coexist on both dedicated and converged customer networks. Topics include VLANs, VLAN tagging, multicast, PIM, uplinks, bandwidth requirements, and calculations.

MFX-311

## Advanced UC Scenarios

🕒 90 minutes

🎯 Lecture, Exercises

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**PREQ:** None

Sink your teeth into large, odd, or downright challenging UC applications. We'll explore some off-the-beaten-path design requirements such as divisible spaces, large all-hands areas, multiple controllers, multiple cameras, government chambers, and how platform-specific features such as Zoom® Intelligent Director and Microsoft® IntelliFrame will influence your designs.

MFX-312

## Mastering Microsoft Teams Rooms with Cutting Edge Advancements

🕒 90 minutes

🎯 Lecture, Lab

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**PREQ:** Previous knowledge of Crestron Flex solutions is helpful

Plan for success with Microsoft Teams® Rooms by diving into the latest features and capabilities from Crestron and partners. This session provides a focused exploration of the latest tools and techniques that can be used to offer an enhanced range of solutions to your design needs.

MPG-311

## Advanced .AV Framework Workshop

🕒 90 minutes

🎯 Lecture, Exercises

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**PREQ:** None

You will not only learn the capabilities, limitations, and use cases, the class will also deploy an .AV Framework™ web-based configuration platform system from scratch faster than you thought possible. You will also learn how to manage and copy room configs to the rest of the campus, delivering greater efficiency with each additional room.

## Intelligent Video Design Courses

MIV-241

### Advanced Automate VX Design Certification

🕒 6 hours (two 3 hr. sessions)

🎓 Lecture, Lab

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**PREQ:** CTI Intelligent Video Path  
(self-paced online courses)

🔗 [Crestron 1 Beyond Camera Manager Software](#)

🔗 [Intelligent Video Room Designer Software](#)

🔗 [Understanding Automate VX Software](#)

🔗 [Design Overview for Intelligent Video Products](#)

🔗 [Design for Automate VX](#)

In this course we will introduce the capabilities of Crestron's all-new camera and server lineup. Learn how to make appropriate design decisions for camera selection and positioning, microphones and DSPs, and Automate™ VX voice-activated speaker-tracking solution server selection.

You will create your own .1brd design configuration files and understand how to engage Crestron's Professional services for the most successful outcomes. Bring more value to your organization with this MTA-exclusive opportunity to earn certification in person.

## Panel Discussion

MTA-311

### AV Trends: AI, Metrics, Human-Centric Design

🕒 90 minutes

🎓 Discussion Panel

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**PREQ:** None

Customers increasingly want their technology to get out of the way, seamlessly blend into existing workflows, and create experiences that bring people together.

Join subject matter experts in a lively panel discussion and interactive Q&A anchored by the most significant buzz terms facing our industry.

# Modern Work Summit & Crestron Masters Sales Associates

Modern practices centered around flexible work patterns and digital technologies are changing decisively from first movers in business to the mainstream. Early experiments and iterative explorations of hybrid work and artificial intelligence are being replaced by broader adoption and implementations as employers work on developing standard practices. The dynamic of meetings changes as they become hybrid, and trends like these are accelerating the need for decisive strategies that foster productivity and collaboration.

Artificial Intelligence is having an impact on meeting experience and expectations. The challenge is how AI and IoT fit into the workspace. AI is already in use, from AI in camera-tracking technology to building automation and meeting experience. How is AI being used to improve experience in the workplace?

**MWS-101**

## **Welcome to AI in Meeting Spaces**

🕒 45 minutes

🎤 Presentation

Artificial intelligence (AI) is already widely used in daily communication, but despite concerns about AI's adverse effects on society, the social consequences of using it to communicate remain largely unexplored. AI is used in meeting spaces today. How is this new technology in use, and what is the impact?

**MWS-102**

## **AI Innovations in Media and Communications**

🕒 45 minutes

🎤 Presentation

AI is now prevalent throughout the tools we use every day. Where is AI taking our communication platforms?

**MWS-103**

## **Reinvention of the Modern Office**

🕒 45 minutes

🎤 Presentation

The global pandemic brought our attendance in the office to an abrupt halt and triggered a complete re-evaluation of the purpose of the workplace. With the return to the new normal, what does the workplace look like? Who is coming back and why? What are the new goals for the modern office?

**MWS-104**  
**Helping Your Customers Move Beyond Hybrid Work**

- 🕒 45 minutes
- 🎤 Presentation

If you are like many organizations, getting to a productive state of hybrid work has been hampered by a variety of obstacles: changing health conditions, conflict with new organizational goals, and employee resistance. As you reconsider your next steps (or formulate your first efforts), you can learn from the research that underpins this session. Join Craig Durr Research Director - Workplace Collaboration | The Futurum Group as he shares with you some of the common challenges identified in early efforts, and insights as you plan your path forward. The key, you will learn, is to reframe hybrid work as a journey, not a destination.

**MWS-105**  
**Employee Experience: Beyond Hybrid Work**

- 🕒 45 minutes
- 🎤 Presentation

Organizations must rethink how to face the new challenges that hybrid work brings considering that there are no magic sticks or universal solutions. A new operating model should be considered with at least three dimensions: people, processes, and places. To design and implement the right operating model for every organization and every role, culture and technology must go together, providing a holistic approach to enable and optimize employee experience in the hybrid work environment. During this session we will go through Microsoft's approach and technology solutions that focus on these challenges related to hybrid work, employee experience, and space transformation.

**MWS-106**  
**The Meeting Space for Today and Tomorrow**

- 🕒 45 minutes
- 🗣️ Panel Discussion

The workplace has changed significantly over recent years — where technology was a luxury, it is now a necessity. Hybrid is now mainstream and widely adopted; the right strategies and collaboration technologies will need to be implemented for the evolving modern workplace. Throughout this session, we will explore the new challenges employers and employees face when striving for a more efficient, effective, and inclusive workplace.