

Nine Dot Connects PCB-Centric Training Courses & Schedule

What's stopping you from designing hardware?

In the world of PCB design, more than cursory knowledge of the PCB process and circuit theory is required. There are dozens of processes, hundreds of tasks, and thousands of decisions to get a PCB from conception to physical reality. At Nine Dot Connects, we “get it”, and we get where you are coming from. That's why we developed these PCB centric classes so you can be more engrossed in developing your ideas into hardware rather than being held back by a process that can be messy and extremely frustrating.

The classes we developed come from accumulative decades of PCB experience as designers, managers, technical writers, application engineers, and course instructors. We have seen what is out there and, quite frankly, we believe that there is room for improvement in the general understanding of PCB design. We have embarked on an effort to provide what we at Nine Dot Connects believe are the missing pieces to a well-rounded education on PCB design.

We are proud to offer the classes below. Many more to come...

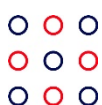
Additional training information such as cost, registration, student, review, etc. is available at <https://ninedotconnects.com/training> and the embedded pictures are linked to specific training course overview webpage.

Foundations – PCB Design (3 days)

This training is complete overview of the PCB process, from conception to manufacturing. It was created to provide all the important details a PCB designer would need for a smooth, efficient design process. In addition to looking at the schematics and PCB from a process point of view, the lesser understood but vitally important topics of fabrication, assembly, DFM, DFT, and specification writing are also presented.

- Day 1 – PCB Manufacturing Flow
- Day 2 – Library Etiquette and Schematic Capture Flow
- Day 3 – PCB Design Flow and Documentation

This training will be hands on in addition to lecture. No prior tool knowledge is necessary; a basic understanding of circuit design is recommended. Though this training is designed to educate designers on the entire process, those in managerial positions seeking to improve their group's design flow will find this training valuable.



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Boot Camp - Altium Designer (3 days)

This training helps you quickly ramp up on the fundamentals of Altium Designer. In this training, students will create components using the symbol and footprint libraries, and use these components in both a schematic design and PCB layout. The PCB layout instruction includes: preliminary groundwork necessary such as layer stack up and rules; placement of footprints; and routing of connections. You will also get hands-on practice generating manufacturing files from schematics (BOM) and PCB (Gerber and drill files).

- Day 1 – Environment, Config Mgmt, Editors
- Day 2 – Schematic Capture and PCB Setup
- Day 3 – PCB Place & Route and Output Files

This class is a combination of lectures introducing workspace panels and relevant dialog boxes, with exercises to create components, draw schematics, layout the PCB, and generate manufacturing files.



Spec Ops - Altium Designer (3 days)

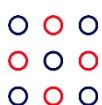
The Spec Ops course will continue where boot camp leaves off, taking the design and documentation processes to the next level.

In 3 days, Spec Ops will help you become more productive in the PCB environment through effective use of Altium Designer and its features. Along with detailed documentation and data management topics, advanced routing and construction techniques will be explored. Mastering high-speed design constructs like differential pair routing, length matching and tuning will be introduced and reinforced. Additionally, you will be introduced to many of Altium Designer's latest features, geared toward maximizing innovation and efficiency.

- Day 1 – Data Mgmt, What's new in AD19 & Schem Spec Ops
- Day 2 – Board Setup, Rules and Placement
- Day 3 – Routing, Length Tuning and PCB Spec Ops



The ideal entrant into our Spec Ops course will be a Nine Dot Connects Boot Camp graduate or an Altium Designer user who is comfortable with navigating the software. The student gaining the most would be the PCB designer who wants a boost in productivity, design accuracy, or level of detail in their designs, as well as the engineer who is looking to achieve the next level of creativity and innovation.



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Full Spectrum - Altium Designer (4 days)

The Full Spectrum Course is a four-day training that combines the core areas of our three-day Boot Camp course, with the principle subjects of our three-day Spec Ops course.

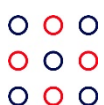
This training is intended for Altium Designer users with early to moderate experience, or for those with high proficiency in other EDA tools who wish to evaluate the abilities of Altium Designer through instruction and hands on exercises. This course is an effective alternative to spending a total of six days over two weeks attending the Boot Camp and Spec Ops courses. With Full Spectrum, it's done in as few as four days in the same week, while still covering a considerable amount of information at a somewhat faster pace.

The Nine Dot Connects Boot Camp course helps both new and more experienced users ramp up on the fundamentals of Altium Designer. The Full Spectrum course builds on this by quickly covering the fundamentals of each subject, then moving into more advanced techniques and features that would normally be taught in our Spec Ops course. Due to time constraints, the areas not covered from the Spec Ops course are the more specialized features of the tool.

Like our Boot Camp course, this is a project-based training that covers many functions and features of the software and how to use them most effectively in a standard project flow. Emphasis is on setup, navigation, and features that are key to becoming efficient and comfortable with the tool. Advanced routing, layout techniques, and high-speed design constructs, like differential pair routing, length matching, and tuning, will be discussed and demonstrated as well. After each module's instruction, highly applicable exercises reinforce the understanding of the content.

Areas covered by this training:

- Altium Designer Overview for newer users to the tool.
- Advanced tool settings, navigation, and use of panels.
- Project creation and design file management.
- Creating components using the Schematic and PCB Footprint library editors.
- Schematic capture utilizing component libraries and the extensive feature set of its editor.
- Advanced PCB setup (stack up, all via type definitions, back drill, rigid/flex, board outline).
- Extensive coverage and setup of Design Rules in both the schematic and PCB editors.
- Efficient component placement using special techniques and features.
- Basic Interactive routing as well as advanced routing features used for high speed designs.
- Planes and Polygon use.
- Generating drawings and Outjob manufacturing file sets.



Nine Dot Connects PCB-Centric Training Courses & Schedule

Onsite/Online – Customized Training – 2 or More Days

Though we offer coaching and consulting services, the focus is on specific needs of a tool or process or project. Therefore, we realize that some clients may have some specific training needs that just aren't going to get adequately addressed even with our various course offerings. This is especially true when it comes to tool flow, cabling, libraries, and process flow.

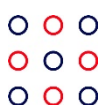
This is exactly the reason why we offer a customized onsite training that can be customized to meet the needs of your organization. We offering customization based on the following scenarios:

- Mix and Match
- Topics that Aren't Covered in Courses
- Best Practice and Maximizing Reuse Concept



Our onsite training offerings are customizable to fit your needs:

- **Schedule** – Can't do weekdays? If you are using your Saturdays to 'catch up', we can be there, too! You pick the start date!
- **Time** - Can't do 9 to 5? Training does not have to be all day. The number of hours and the start time can be set by you.
- **Location** – Can't leave the facility due to the travel downtime? We can come to you and save you the travel hassle and all expenses.
- **Cost** - Don't want to bear the travel cost of your employees? The cost is much more effective due to volume discount and no travel cost.
- **Content** – Worried that you will waste time on unnecessary content? We can customize the training to meet your needs.
- **Equipment** – Don't have laptops that can be spared for training? We have equipment that can be shipped to any location.
- **Quality** – Worried about the level of excellence in the instruction and/or instructors? Our instructors have worked extensively as engineers prior to becoming instructors. Combined, they have delivered over 500+ classes and thousands of hours highly regarded training. Take a look at some reviews here.
- **On Demand** – Just need someone to guide you every so often? We provide a block of consulting hours to be used to allow you to continue to do your work with the assurance that there is someone available to assist when the going gets tough.



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Spec Ops Training - 2 or More Days

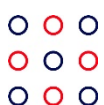
Not all class can be offered as a standard course which addresses the needs of many and we recognized some training topics are just as important as the ones offered as a standard course.

To accommodate your needs when it comes to topics of this nature, we offer the Spec Ops training series. These training courses are customized to your needs and agenda. The training can be done on-site or on-line, depending on best way to interact with you and your colleagues.

Listed below are training courses that we have done in the past for our customers. If you have a need that is not listed, please contact us to see what we may be able to do for you.

Listed below are training courses that we have done in the past for our customers. If you have a need that is not listed, please contact us to see what we may be able to do for you. Check out these specialized Spec Ops training courses:

- [Concord Pro / NEXUS / Vault](#)
- [Library Methodology and Data Management](#)
- [Configuration Management](#)
- [Cabling in Altium Designer](#)
- [SPICE](#)
- [High Speed Signal Layout](#)



Nine Dot Connects PCB-Centric Training Courses & Schedule

Start Date	Training Course & Registration	Location
February 2	<u>Boot Camp - Altium Designer (3-days)</u>	<i>Interactive Online</i>
February 9	<u>Foundations – PCB Design (3-days)</u>	<i>Interactive Online</i>
February 16	<u>Full Spectrum - Altium Designer (4-days)</u>	<i>Interactive Online</i>
March 2	<u>Spec Ops - Altium Designer (3-days)</u>	<i>Interactive Online</i>
April 6	<u>Boot Camp - Altium Designer (3-days)</u>	<i>Interactive Online</i>
April 20	<u>Full Spectrum - Altium Designer (4-days)</u>	<i>Interactive Online</i>
May 4	<u>Foundations – PCB Design (3-days)</u>	<i>Interactive Online</i>
May 18	<u>Spec Ops - Altium Designer (3-days)</u>	<i>Interactive Online</i>
June 8	<u>Boot Camp - Altium Designer (3-days)</u>	<i>Interactive Online</i>
June 22	<u>Full Spectrum - Altium Designer (4-days)</u>	<i>Interactive Online</i>
July 13	<u>Foundations – PCB Design (3-days)</u>	<i>Interactive Online</i>
August 3	<u>Boot Camp - Altium Designer (3-days)</u>	<i>Interactive Online</i>
August 10	<u>Spec Ops - Altium Designer (3-days)</u>	<i>Interactive Online</i>
October 5	<u>Foundations – PCB Design (3-days)</u>	<i>Interactive Online</i>
October 12	<u>Boot Camp - Altium Designer (3-days)</u>	<i>Interactive Online</i>

