



TESTING, ADJUSTING & BALANCING (TAB) CERTIFIED PROFESSIONAL SEMINAR

A Unique Opportunity for Hands-on Training in the Ultimate Hydronic Classroom

OCTOBER 9-11, 2017



SEMINAR DATES

OCTOBER 9-11, 2017

SEMINAR REGISTRATION DEADLINE

SEPTEMBER 25, 2017

OPTIONAL TAB CP PAPER-BASED EXAM DAY

OCTOBER 12, 2017

OPTIONAL TAB CT PAPER-BASED EXAM DAY

OCTOBER 12, 2017

LOCATION

IMI TRAINING FACILITY, ROSWELL, GA

ABOUT THIS SEMINAR AND INSTRUCTORS

About This Seminar

An opportunity to sharpen your skills on live systems

Building owners and tenants are concerned that environmental performance of buildings must be optimal while operating costs should be minimal. These goals can only be accomplished when a building's HVAC and hydronic systems are properly balanced. Three major steps used to achieve the proper operation of the HVAC and hydronic systems and a desirable climate are testing, adjusting and balancing (TAB).

Learning Objectives

This three-day seminar provides attendees with an overview of the testing, adjusting and balancing aspects of the TAB discipline, including:

- Developing and planning the work flow
- Handling report preparation
- Recommending corrective action
- Setting an overall safety plan
- Maintaining instruments and calibration program
- Reviewing experience with control strategies, sequence of operation, control systems, equipment and software
- Reviewing all processes to achieve a proper final TAB Report

Who Should Attend

- Professionals with a strong background in HVAC and TAB work who believe an extensive review in a classroom setting will enhance their technical education
- Facility Managers and Operators
- Mechanical Contractors
- Engineers
- Energy Auditors
- Building Commissioning Agents
- Qualified Candidates for NEBB TAB CP Certification
- Qualified Candidates for NEBB TAB CT

Instructors

Andy Nolfo, PE



Andy Nolfo has more than 40 years' of experience in the mechanical engineering; testing, adjusting and balancing; and commissioning industries. He has been a Registered PE since 1977 and the key author and editor of many NEBB publications. He

is a current member of the NEBB TAB committee and a past NEBB director. As one of the original authors of the NEBB National TAB CP Review Seminar, Nolfo provides training for additional instructors and help maintain continuity in continued growth of the TAB seminars.

Travis Short



Travis Short is the vice president of Sys-Tek an MEP engineering firm, commissioning provider, and TAB company. Travis has more than 17 years' experience and received his bachelor's degree in mechanical engineering from the Missouri University of Science & Technology. He is a NEBB Certified Professional in both Building Systems Commissioning and Testing, Adjusting and Balancing of Environmental Systems. His capabilities range from large central utility plants to geothermal heat pump technologies. His advanced knowledge of building automation and management systems stems from his experience in designing, building, installing, and programming various systems ranging from HVAC controls to PLC's. He is a published author with chapters in "Web Based Energy Information and Control Systems" and "Web Based Enterprise Energy and Building Automation Systems."

This TAB seminar has been awarded 22.5 continuing education credits (CECs) by NEBB.

SEMINAR SCHEDULE AND REQUIREMENTS

Recommended Publications

To achieve the best learning results, it is highly recommended that attendees read the publications listed below BEFORE attending the seminar.

Instruction is based on the assumption that all attendees have a thorough working knowledge of the requirements of these NEBB publications prior to attending the seminar. Publications can be purchased online at www.nebb.org.

- *NEBB Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems*
- *Testing, Adjusting & Balancing Specifications*
- *TAB Technician Manual* (TAB CP oversees this work by the Certified Technicians)
- *TAB Professional Home Study Course*

Attendee and Seminar Requirements

Attendees must have, or bring, the following prior to registering for this seminar:

- Verifiable practical TAB experience
- Minimum working capability in mathematics, including geometry and second-year high school algebra
- Well versed in the application of mathematical formulas that are pertinent to TAB
- Possess a full working knowledge of the instruments required for certification by NEBB
- Possess full understanding of when, where and how to use the instruments
- Straight edge
- Hand calculator (with square, square root, cube and cube root functions)
- Pencils
- Laptop/iPad to review course materials

TAB CP Seminar Schedule

(Subject to change)

OCTOBER 9	
8:00 am	Registration
8:30 am - 5:00 pm	Measurements, Instruments, Reports, Procedural Standards
Break: 10:00 am – 10:15 am Lunch: Noon – 1 pm Break: 3:00 pm – 3:15 pm	
OCTOBER 10	Systems, Thermodynamics and Psychrometrics
8:00 am - 5:00 pm	
Break: 10:00 am – 10:15 am Lunch: 12:00 – 1:00 pm Pm Break: 3:00 pm – 3:15 pm	
OCTOBER 11	Electrical, Controls, Building Systems and Pressure Loss Calculations
7:30 am - 5:00 pm	
Break: 10:00 am – 10:15 am Lunch: Noon – 1:00 pm Break: 3 pm – 3:15 pm	
OCTOBER 12	Optional TAB CP or CT Written Exam <i>See page 7 for complete certification and exam information.</i>
8:00 am - 2:00 pm	

Visit the Hydronic Wall!

Seven system modules each using a different balance technology.

SEMINAR OVERVIEW AND REMINDERS

This seminar will cover engineering principles, charts, diagrams, problem solving and techniques, along with reviewing HVAC principles involved with TAB work and HVAC testing, including:

Formulas and Their Use: Formulas are used daily by a TAB professional and should be memorized and applied appropriately as needed. Formulas include ratios of speed vs volume vs pressure vs BHP for air and hydronic systems. Other formulas that become necessary on occasion include V-belt length, BTUH, sensible, latent and total heat, and others. Attendees will receive a list of commonly used formulas for their use and application.

Electricity: Attendees will re-familiarize themselves with single vs three phase systems, how to measure voltage and amperage, overload protection, calculation of brake horsepower and the need for using safe practices and safety equipment for protection while gathering necessary measurements.

Fan Laws and Curves: Fan affinity laws will be covered and Attendees will review how to apply known data to fan curves. Instructors will discuss individual fan systems as well as fans in series and fans in parallel.

Pump Laws and Curves: Pump affinity laws and how to apply known data to pump curves will be discussed and demonstrated. Individual pumping systems as well as open systems, closed systems, pumps in series and pumps in parallel and NPSH requirements will be covered.

Air Systems: Various configurations of air systems such as supply, return and exhaust systems as well as constant volume, variable volume heat recovery, induction systems, active chill beam systems, and makeup air systems will be reviewed.

Hydronic Systems: Various configurations of hydronic systems will be discussed such as one pipe, two pipe, three pipe and four pipe systems;

heating water systems, chilled water systems, condenser water systems positive displacement pumps, primary/secondary systems, tertiary pumping systems.

Psychometrics: The use of a psychrometric chart as it applies to TAB and relates to the physical properties of air and the relationship of the properties to each other will be reviewed. Attendees will spend considerable time learning to plot psychrometric charts and understand the principles.

Problem Solving: TAB professionals identify problems and determine solutions or provide necessary information for responsible parties to address and correct the problem. This involves solid logic capabilities requiring the professional to exercise a systematic approach to the identification and resolution of problems or difficulties exposed by the TAB process.

Important Reminders

1. **Registration deadline is September 25, 2017.**
2. Enrollment is limited to 24. Registrations will be filled on a "first come, first served" basis.
3. Seminar fees include course instruction, lunch, and am/pm breaks will be provided October 9-11. Seminar fees do not include anything pertaining to certification. See page 7 for complete details on the certification and exam process.
4. Registrants will receive a confirmation letter, including instructions regarding required seminar materials.
5. Questions? Call 301.977.3698 or email training@nebb.org.

Please note: This is not an exam review or exam refresher seminar. This is an educational seminar. Attending this seminar is insufficient for successful completion of the TAB CP or TAB CT exams. The material presented, along with time allocated, is meant to provide an overview of the engineering principles and field practices required of project-management level personnel.

HOTEL, TRANSPORTATION AND IMPORTANT DATES AND TIMES

Important Dates and Times

Seminar Location: IMI, 1000 Holcomb Wood Pkwy
Building 100, Suite 124
Roswell, GA 30076

Arrival in Roswell, Georgia: Sunday, October 8, 2017

Seminar Dates:

Monday & Tuesday, October 9 & 10, 2017: 8:00 am – 5:00 pm

Wednesday, October 11, 2017, 7:30 am – 5:00 pm

Optional TAB CP or TAB CT Paper-based Exam Day:

Thursday, October 12, 2017, 8:00 am – 2:00 pm

Airport

Hartsfield-Jackson Atlanta International Airport (ATL) serves the Roswell area. IMI and the hotels listed below are approximately 30 miles from the airport (about a 45-60-minute drive). Taxi service is available at the airport.



Don't miss this chance to sharpen your skills on live systems!

Instructors will demonstrate

- ◇ Production Systems,
- ◇ Distribution Systems, and
- ◇ BMS Systems

Hotels

Attendees should make room reservations directly with the hotel of their choice. Below is a short list of hotels in close proximity to the training center. Hotel and transportation costs are not covered by the seminar registration fee.

- Double Tree by Hilton-Roswell, 1075 Holcomb Bridge Road, Roswell, GA 30076, Phone: 770.992.9600
Distance from the Training Center: 1.2 miles (8-minute drive)
- Hyatt Place-Atlanta, 7500 North Point Circle, Alpharetta, GA 30022; Phone: 770.594.8788
Distance from the Training Center: 3 - 4 miles depending on the route (7-9-minute drive)
- Holiday Inn-Atlanta/Roswell, 909 Holcomb Bridge Road, Roswell, GA 30076; Phone: 770.817.1414
Distance from the Training Center: 1.7 miles (9-minute drive)

NEBB TAB CP SEMINAR REGISTRATION FORM

1. Pre-registration and payment of fees are necessary to ensure your participation in the seminar.
2. **Registration form and payment must reach the NEBB Office on or before September 25, 2017.**
3. Register: Online by using the Certelligence Portal at www.nebb.org, or mail this form to: NEBB, 8575 Grovemont Circle, Gaithersburg, MD 20877-4121

4 **Phone:** 301.977.3698

Fax: 301.977.9589

Email: training@nebb.org

Name _____ Date _____

Company _____

Address _____

City, State, ZIP _____

Phone / Cell _____ Fax _____

Email _____ Chapter _____

Please list any dietary restrictions _____

Seminar Fee (Check all that apply)

- ☐ \$1,195 TAB CP Seminar Registration Fee for Monday-Wednesday (TAB CP & CT exams require separate fees. See p. 7 for details on the certification and exam process)

Publication Fees

- ☐ \$600*/\$800* *TAB Profesional Home Study Course* (NEBB/non-NEBB)
- ☐ \$60*/\$95* *Procedural Standards for the TAB of Environmental Systems* (NEBB/Non-NEBB)
- ☐ \$105*/\$160 *TAB Technical Manual* (NEBB/Non-NEBB)

*Prices for publications do not include shipping and handling.

Payment Method

- ☐ Check Enclosed made payable to NEBB
- ☐ Visa ☐ MasterCard ☐ American Express

Name on Card _____

CC Number _____

Expiration Date _____

Security code _____

Signature _____

\$ Total Amount Paid

Cancellation Policy

Cancellation by registrants, regardless of reason, will be subject to a \$250 service charge to cover NEBB's expenses. A refund of the prepaid registration will be made less the \$250 service charge.

No shows or late cancellations (those persons registered for the seminar who do not cancel 14 days prior to the seminar and subsequently do not attend the course) will forfeit the entire registration fee unless a replacement can be found.

NEBB reserves the right to cancel any seminars having insufficient registrants, in which case, all prepaid registration will be refunded in full. NEBB is not responsible for any losses resulting from cancellation of a seminar.

Please advise NEBB and your hotel of your cancellation as soon as possible.

CERTIFICATION AND EXAM PROCESS: A STEPPED APPROACH

NEBB's TAB certification program, whether for the TAB CP or the TAB CT, offers tangible proof that professionals are qualified in the proper methods and procedures for testing building systems for optimum performance. The program sets the testing standards of the knowledge, skills and abilities for the certification of CPs and CTs who perform these functions.

Professionals who desire to achieve TAB CP and CT certification and who want to sit for the exam at the conclusion of the TAB CP seminar are required to be in compliance with and complete all certification requirements and processes BEFORE attending the training seminar.

Please begin your certification process well in advance.

1. Success with certification comes with dedicated self-study and preparation. NEBB recommends that Candidates for the TAB CP or TAB CT refer to their specific Candidate Handbook Appendix for specific recommended readings and certification information. Email certification@nebb.org for assistance or visit www.nebb.org to download the latest version of the Comprehensive Certification Handbook.
2. To obtain a TAB CP or TAB CT certification and exam information, please email certification@nebb.org.
3. **Deadline for receipt of TAB CP or TAB CT Applications for Candidacy: Monday, September 11, 2017. Last-minute applications or walk-ins to the exam will not be accepted.**
4. Pre-requisites must be met and the TAB CP or TAB CT Applications for Candidacy must be submitted for approval and the certification application fees paid. **Once approved, the Candidate will receive payment information for the TAB CP or TAB CT paper-based written exams.**

5. TAB CT and CP Certification Fees

- Application for Candidacy fees and exam fees are separate from the training seminar fees, publications or any training-related items.
- All exam-related fees are final but can be transferred.

TAB Certified Technician

Application for Candidacy Fee: \$50

Exam Fee: \$200

Application for Certification Fee: \$25

Certificate Fee: \$30

TAB Certified Professional

Application for Candidacy Fee: \$100

Written Exam Fee: \$500

TAB Pre-Field Report & Error Finding Courses & Exams: \$325 each (www.HVACReduction.net)

Practical Exam Fee: Contact Your Local Chapter for more information

Application for Certification Fee: \$50

Certificate Fee: \$30

For more certification information or applications, please e-mail certification@nebb.org.

6. Because a Candidate's exam results are entered into Kryterion, NEBB's online exam processing center, Candidates are required to set up a profile on Kryterion in advance of sitting for the TAB CP or TAB CT exams. **Instructions on the process will be sent.**
7. Those who wish to sit for the TAB CP or TAB CT exams must have all facets of the certification process completed prior to attending the TAB seminar.



NEBB
8575 Grovemont Circle
Gaithersburg, MD 20877
Phone: 301.977.3698
Fax: 301.977.9589
Email: training@nebb.org