

## Environmental Noise Measurement & Analysis Seminar

( March 20-21, 2023 | October 2-3, 2023 )

**Background Discussion & Abstract:** Navcon is an engineering consultancy which specializes in noise and vibration measurement, analysis and control. We have been presenting the Environmental Noise Measurement & Analysis since 1995. This course focuses upon the practical aspects of Environmental Noise planning, data acquisition, modeling, noise regulations and assessment.

Attendees are encouraged to bring a laptop computer to class for use during the laboratory exercises. We will load a fully functional copy of the noise modeling software, **SoundPLAN** on the laptops with a 30 license. The software will be used for laboratory exercises.

**Intended Audience & Course Objective:** This *two-day* course is intended for engineers, technicians and hygienists tasked with environmental, community, and/or industrial noise measurement, planning, analysis and control. Lectures cover the fundamentals of acoustics, source characterization, outdoor noise propagation (including national and international standards), local, state and federal noise regulations. Laboratory exercises include sound power and community noise measurements, the development of acoustical models, and analytical noise level predictions.

### Presenters:

**Hans Forscher**, Senior Acoustical Engineer received his bachelors and masters degrees from the University of Stuttgart where he concentrated on indoor & outdoor noise modeling and acoustical modal analysis. He has consulted with numerous companies in Europe, South East Asia and the United States in the field of environmental noise and structurally radiated noise problems for more than 25 years. Hans also provides technical support for the noise modeling software, SoundPLAN.

**Jim Steedman**, President of Navcon Engineering received his bachelors and masters degrees from the University of Cincinnati where he concentrated on modal testing, structural dynamics modification and acoustics. He has consulted in the field of noise and vibration measurement, analysis and control since 1977. Jim has traveled worldwide consulting and presenting courses on acoustic intensity, environmental noise, modal testing and noise & vibration control.

**Course Fee: \$2,200** per attendee. The course fee includes participation, seminar manual, lunches and refreshments. A full refund will be made for all cancellations received 30-days before the start of the course. No refunds will be granted after the 30-day deadline. Substitute attendees will be accepted at any time. In the event that we have to cancel the course, the course fee will be refunded in full, but we disclaim any further liability.

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## Environmental Noise Measurement & Analysis – Training Outline

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### Fundamentals of Acoustics

- Basic physics: definition of motion and the wave equation
- Sound pressure, sound intensity and sound power
- The decibel scale (adding/subtracting/averaging sound levels)
- Noise descriptors  $L_p$ ,  $L_I$ ,  $L_W$ ,  $L_N$ ,  $L_{eq}$ ,  $L_m$
- Time weighting & frequency filtering
- Near, far, free and reverberant sound fields
- Time and frequency domain (octave and FFT) analysis
- Measurement considerations
- Wave propagation, sound spreading, reflection, diffraction

### Source Characterization

- Point, line and area sources
- Noise source emission (intensity and sound power)
- Sound radiation/directivity patterns
- Steady state, transient and tonal sound sources
- Measurement in accordance with ISO, ANSI and manufacturer standards

### Outdoor Noise Propagation

- Principal formulas and methodologies
- Transmission path attenuation (divergence, air absorption, screening and scattering reflections, ground effects, wind effects, meteorological stability)
- Review of National & International guidelines/standards (ISO, VDI, Nordic, CONCAWE, FHWA, ...)
- Development of propagation models for rail, traffic, industry and leisure noise)
- “*Rules of Thumb*” for outdoor noise analysis

### Demonstrations, Hands-on Laboratories and Outdoor Exercises

- Sound power determination using sound pressure & sound intensity methods
- Sound radiation/directivity determination using sound pressure & intensity methods
- Community noise measurement and characterization based upon statistical descriptors
- Development of a 3-D, computer generated acoustical model
- Presentation of measured noise data, sound level diagrams and noise contour

**Environmental Noise Measurement & Analysis – Registration Form**

<b>Name</b>	
<b>Company</b>	
<b>Address</b>	
<b>City, State, Zip</b>	
<b>E-Mail</b>	
<b>Phone</b>	<b>Fax</b>
<b>Date</b>	<b>Signature</b>
<b>Class Date</b>	<b>March 20-21, 2023</b> <input type="checkbox"/> <b>October 2-3, 2023</b> <input type="checkbox"/>
<b>Payment</b>	<b>P.O. No.</b> ..... <b>Company Check</b> <input type="checkbox"/> <b>Payment: US \$2,200.00</b> <b>Bank Transfer</b> <input type="checkbox"/> <b>Credit Card: Visa</b> <input type="checkbox"/> <b>MasterCard</b> <input type="checkbox"/> Credit Card #: _____ Expiration Date: ____ / ____ Name on Credit Card: _____ Billing Address: _____ Billing Zip Code: _____ Card Verification Value CVV #: _____ (3 digits on the back)

*The course fee is \$2,200 per attendee. We accept company purchase orders with terms of Net 30 days, company checks, money orders, bank transfers and credit card (Visa, MasterCard). A full refund will be made for all cancellations received 30-days before the start of the course. If we must cancel the course, the registration fee will be refunded in full, but we disclaim any further liability. The course fee includes participation, course notes, lunches and refreshments. We offer vegetarian options and we will try to accommodate other dietary requests; please let us know in advance. The training room has stairway access only (no elevator or escalator access). For administrative & technical questions please call 714-441-3488. To register, please fax this page to +1-714-441-3487 or email to [webinfo@navcon.com](mailto:webinfo@navcon.com).*