Understanding Acoustics in Architecture & Green Design

Introductory Acoustics : 3 Courses

01 - Fundamentals of Sound and Architectural Acoustics (HSW)
This program covers the fundamentals of architectural acoustics and some commonly misunderstood principals. Topics include: sound generation and propagates; human sound perception; sound level descriptors; and acoustic properties of materials.

4 Learning Objectives:
1) Examine how sound is generated and propagates as a principle for architectural acoustic design.
2) Explore how humans perceive sound as a basic principle in acoustic design.
3) Recognize sound level descriptors and how they are used in architectural acoustics.
4) Analyze acoustic properties of typically used materials for design consideration.

02 - Sound Isolation Secrets (HSW)
Answering questions like “How many layers of drywall do I really need?” involves a practical understanding of how sound transmission occurs through a building’s structural components including floors, ceilings and partitions. In addition to deciphering comparative ratings such as STC, NIC and IIC, this presentation describes construction and material options for attaining increasing levels of acoustic privacy. Learn the tips, tricks and traps that, if not caught and corrected early in the design cycle, can become glaring problems potentially requiring costly redesign and rework.

4 Learning Objectives:
1) Ascertain how sound is transmitted through building components.
2) Explore comparative ratings and metrics relevant to architectural acoustics.
3) Differentiate among materials and practices for increasing sound isolation within the interior of a building.
4) Identify how to catch potential acoustic mistakes early in the project to reduce future redesign and rework.

03 - “Hear” Your Project Before it is Built - the Benefits of Acoustic Modeling and Auralization (HSW)
Acoustic models and their associated auralization allow designers to listen to their space before it is built. Through a combination of 3D computer modeling and audio signal processing, an aural rendering or “Auralization” of a space can be created to demonstrate what the space will sound like during a performance, lecture, banquet, or other typical use. Auralization can help designers to develop and refine the design of a space and can be an invaluable communication tool for conveying the effects of different design features. In addition, auralizations can help clarify design objectives and aid in generating agreement and understanding among the many stakeholders for a given project. Using case studies, this seminar will present the range of applications of auralization and its role in the design process.

4 Learning Objectives:
1) Determine what an acoustic model and auralization is as it relates to building design.
2) Examine how the model and associated auralization is created to understand a space’s sound prior to final design and construction.
3) Recognize the reasons to create an acoustic auralization during the design phase.
4) Define the type of projects that can benefit from acoustic model and auralization as part of the design process.
Designing for Videoconferencing and Distance Learning: 4 Courses

01 - An Introduction to Design and Planning for Audiovisual Technologies
AV and IT technology enhance many of today’s rooms. Learn how boardrooms, auditoria, classrooms, and videoconference facilities will function better with designs that keep technology and aesthetics in parallel. See examples where loudspeaker placement, screen size, sightlines, and IT considerations improved the space and fit the functionality.

4 Learning Objectives:
1) Examine important technology elements that impact aesthetics.
2) Identify room types that typically require AV technology.
3) Formulate how to approach the design of various areas of a room that must accommodate AV equipment.
4) Analyze different types of equipment to understand their integration requirements.

02 - Physical Attributes of Successful Videoconferencing and Distance Learning Spaces
This program will help architects and project managers understand the structural and architectural ramifications of professionally designed videoconferencing venues. Topics covered include ideal room attributes, room finishes, lighting, sightline and seating considerations, architectural acoustics and mechanical systems noise criteria.

4 Learning Objectives:
1) Assess ideal room attributes including sightline and seating considerations for videoconferencing venues.
2) Specify the requirements of room finishes and lighting to make the most of videoconferencing and distance learning spaces.
3) Explore the acoustics requirements for successful videoconferencing spaces.
4) Discuss millwork and furniture requirements for such venues.

03 - Technical Planning of Videoconferencing and Distance Learning Spaces
This program is designed to review equipment planning and architectural integration details, power requirements, telecommunication cabling requirements, infrastructure requirements, and AV specific furniture selection for videoconferencing and distance learning spaces.

4 Learning Objectives:
1) Examine types of AV equipment and plan for how they will fit into the requirements of the space.
2) Determine how equipment will integrate architecturally into a space designated for videoconferencing and distance learning.
3) Recognize space planning requirements for spaces designated for videoconferencing.
4) Identify infrastructure requirements for videoconferencing and distance learning spaces.

05 - Equipment Selection for Videoconferencing and Distance Learning Spaces
This program will provide an introduction to the function and technical specification of videoconferencing equipment including the system backbone or transport protocol, CODECS, microphones, cameras, display devices and a primer on videoconferencing control systems.

4 Learning Objectives:
1) Discuss transport protocol – ISDN and IP – as the system backbone of videoconferencing and distance learning spaces.
2) Investigate how CODEC, the “brain” of the system, is integral to how a videoconferencing space functions.
3) Explore different options for microphones, cameras and display devices, and how they fit into the aesthetics of a space.
4) Determine how best to control the components with a videoconferencing space.
Understanding Green Design for Acoustics: 3 Courses

01: Green Acoustics: Acoustics on Green/Sustainable Projects (SD, HSW)
Green/sustainable design is revolutionizing the design and construction industry, providing many benefits to the owners, occupants and the environment through smarter use of energy, water and material resources and improved indoor environmental conditions. In many ways, acoustics and sustainable design complement each other toward achieving higher quality results for projects; however, there are also ways that the two topics can significantly conflict. This presentation will discuss the potential synergies and conflicts of these two design objectives.

4 Learning Objectives:
1) Identify typical sustainable design and acoustic design objectives as related to building projects.
2) Explore the potential synergies between sustainable and acoustical design.
3) Theorize about the possible conflicts between sustainable and acoustical design.
4) Recognize the importance of acoustics for green / sustainable building projects.

02: K-12 Acoustics and Sustainable Design (SD, HSW)
This program will cover the changes related to the updated ANSI classroom acoustics standard, as well as updated acoustics guidelines for sustainable design initiatives such as CHPS and LEED for schools. Also reviewed will be the requirements for room acoustics, sound isolation and background noise in classrooms. Acoustics of special purpose core learning spaces that are included in, but not specifically addressed by, the standards and guidelines will also be addressed.

4 Learning Objectives:
1) Clarify existing standards for ANSI classroom acoustics.
2) Determine updates to the standards for sustainable design initiatives for schools.
3) Examine good practices for room acoustics versus standard requirements as related to sustainable design.
4) Define acoustical design goals for special purpose classrooms not addressed in the guidelines for sustainable design initiatives.

03: Architectural Glazing for Sound Isolation; LEED Challenges & Solutions (SD, HSW)
For most buildings, glazing is selected for its thermal or optical performance; however, there are numerous buildings where exterior noise impacts are a factor in whether the interior space will function properly. Often the most important element for reducing intrusive noise is the architectural glazing. This program outlines acoustical tests and ratings of glazing systems, and various upgrades to architectural glazing. In addition, the challenges and potential solution for achieving LEED points related to glazing and acoustics will be explored.

4 Learning Objectives:
1) Identify acoustical tests and ratings of glazing systems for thermal or optical performance as well as noise impacts.
2) Explore LEED requirements as related to the acoustics within a building.
3) Discover acoustical upgrades for architectural glazing.
4) Discuss how windows affect LEED credits on a building project.