



Acoustics for Architects Seminar: Hearing, Listening, Designing:

ARCH 4619/6605 Special Topics in Environmental Systems Tuesday 2:30 – 4:25 pm 261B E Sibley

This seminar will explore the sonic environment that we inhabit, especially the built environment, in order to become more familiar with the artistry/technology of sound, from noise to music. It is hoped that participating (architecture/design/arts) students will come to consider the acoustic character of their work as important as that of light, form, color, structure, and acquire an abiding interest in “how spaces should sound.” The Cornell campus environment will be our laboratory. In addition, there will be two field trips, one to Binghamton to the laboratory of U. of Binghamton Professor Ron Miles and the manufacturing facilities of McIntosh Labs. The other will be to New York City to explore “The Sound of the City” with acousticians Ben Markham, Robert Lee, and Seth Cluet Director of the Sound Arts Program at Columbia University. This will include visits to major performance venues, an evening performance, and exploration of selected major urban spaces of the City.

The seminar is organized into seven sections: **Listening, Hearing, Basic Principles, Analysis, Field Studies, Designing, Performance.**

I. Listening: We will discuss the act of listening and undertake exercises on listening, which will involve field recording of sounds in and around Cornell/Ithaca, using Zoom H4N digital recorders. In order to appreciate the absence of sound, the class will visit the acoustics lab/ anechoic chamber of Ron Miles at Binghamton University. Following lunch at Audio Classics Inc, the class will visit audio component manufacturer McIntosh Labs to tour their manufacturing facility.

II. Hearing: We will briefly review the biology of hearing/human hearing and introduce essential physical and psycho-acoustic principles. This seminar, presented by Professor of Neurobiology and Behavior Ron Hoy, will explore how hearing is the foundation upon which humans become social beings.

III. Review of Basic Principles: We will take a sprint through the essentials of architectural acoustics with acoustician Ben Markham, Director of Architectural Acoustics, Acentech, Cambridge, Mass., and Cornell Professor of Mechanical Engineering Al George.

IV. Analyses: We will review several formal acoustic analyses of campus spaces that have been prepared by acoustical consulting firms, and visit some of them. Andrew Magre, Assoc. Vice President for Engineering and Project Management will join us in this discussion.

V. Field Studies: Using the campus as our laboratory, we will explore/tour a variety of campus sound spaces and places. Warren Cross, Resident Sound Designer for the Department of Theatre, Film and Dance, will introduce the essentials of acoustic analysis, and using available software/hardware, student teams will analyze the acoustic signature of selected spaces/places on campus. (such as Barton, Bailey, Statler, WSH Theater, Schoelkoph, The Slope, Sage Chapel, Sage Hall, various classrooms/seminar rooms Human Ecology classroom, Barnes, new Goldwin Smith addition, Klarman Hall, The Schwartz theater/black box theater, outdoor spaces, etc)

VI. Designing: Student teams will propose design solutions for campus spaces that will improve the acoustical character of the space/place they have chosen. Finally the class will explore a variety of acoustic space types, in order to think about creating a lexicon of architectural sound spaces. Visiting acoustician, Ben Markham act as consultant/critic during this part of the class.

VII. Performance:

During the final several weeks of the semester, the seminar will attend several campus musical events to engage in some critical listening. Students will conclude the seminar by participating in preparations for Slope Day, under the guidance of Joe Scaffido, Cornell's Director of Campus Activities.

The seminar will meet on Tuesday afternoons, 2:30-4:25

Various brief readings and online resources will be assigned on a weekly basis

The seminar will include several team projects and a final design project

Class size will be limited to 15, and may be taken either for a grade or Pass/Fail

Participating faculty/staff include:

Al George, Cornell Professor of Mechanical Engineering

Ron Hoy, Cornell Professor of Neurobiology and Behavior

Ronald N. Miles, Binghamton University Distinguished Professor of Mechanical Engineering

Seth Cluett, Acting Director, Computer Music Center, Assistant Director, Sound Art Program, Columbia University

Benjamin Markham, Director, Architectural Acoustics, ACENTECH

Warren Cross, Resident Sound Designer, Cornell Department of Theatre, Film and Dance,

Andrew L. Magré, AIA, Associate Vice President, Engineering and Project Management, Cornell University

Joe Scaffido, Cornell's Director of Campus Activities.