

Feb. 26 – March 3, 2017

Department of Applied Mechanics
Motilal Nehru National Institute of Technology
Allahabad, Allahabad – 211004



Course Overview

Due to the recent rapid growth of mobile devices, electroacoustic transducers (EATs), such as moving-coil loudspeakers, miniature receivers, and microphones have been widely used in audio device applications. Currently, it is rare for the designer to have a theoretical foundation for the design of these EATs. Instead, designers rely on the repetitive trial-and-error methodology/process to obtain an ideal EAT design. Obviously, it lacks the capacity for theoretical analysis and innovation in R & D and design. It is pertinent to mention that the simulation plays a vital role in the design and development of products so as to accelerate the product development.

This course provides the basic concepts, analytical skills, and the state of the art techniques in EATs to the participants. The course shall bring them to a level that they can establish a physical model of EATs and prepare them for independent design of EATs. Both theory and practical application in sound-producing and sound-receiving EATs will be emphasized.

Course Objectives

The primary objectives of the course are as follows:

- ❖ Provide a basic knowledge of Electrical-Mechanical-Acoustical analogy and equivalent circuit method.
- ❖ Provide the fundamental theory of electret capacitor microphones and moving coil microphones.
- ❖ Set up a mathematical model for a microphone and analyze it.
- ❖ Provide the fundamental theory of moving-coil loudspeakers and receivers.
- ❖ Set up a mathematical model to design a loudspeaker and miniature loudspeaker.

Course Dates	Feb. 26 – March 3, 2017
Host Institute	▪ Motilal Nehru National Institute of Technology Allahabad, Allahabad – 211004 (UP), India.
You Should Attend If...	<ul style="list-style-type: none"> ▪ Executives, engineers and researchers from manufacturing, service and government organisations including R & D laboratories. ▪ Faculty from reputed academic institutions and technical institutions. ▪ Students at all levels (B. Tech./MSc./M. Tech./Ph.D.).
Fees	<p>The participation fees for the course is as follows:</p> <ul style="list-style-type: none"> ➤ Participants from abroad : USD 300 ➤ Industry/Research Organizations : INR 5000 ➤ Academic Institutions (Faculty) : INR 3000 ➤ Academic Institutions (Student/Research Scholar) : INR 1000 <p>▪ Above fee includes instructional materials, computer uses, and 24 hrs free internet facility.</p>
Accommodation	<ul style="list-style-type: none"> ▪ The participants (Student/Research Scholar) will be provided with single/shared accommodation on payment basis based on the availability in the Hostel. ▪ Accommodation can also be provided in the Executive Development Centre of the Institute on payment basis subject to availability for other participants. <p>All participant have to bear the cost of food during the course.</p> <ul style="list-style-type: none"> ▪ All course registrations will be processed via National GIAN portal (www.gian.iitkgp.ac.in), where Rs. 500/- (one-time fee) is payable in addition to the above amount. ▪ Registration fee can be directly deposited through NEFT to the designated account as given below. <p>Account Name: GIAN ETPDD-2017, Account No.: 718400301000221, Bank: Vijaya Bank, MNNIT Branch, Allahabad-211004, UP, INDIA, IFSC Code: VIJB0007184.</p> <ul style="list-style-type: none"> ▪ Last Date of Registration: 14th February 2017.

The Faculty



Prof. Jin H. Huang

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Prof. Jin H. Huang is currently a Vice-President of Feng Chia University (FCU), Taichung, Taiwan (ROC) and a Distinguished Professor at Department of Mechanical Engineering of FCU. He is also a founder Director of the Electroacoustic Graduate Program of Feng Chia University. He is Chair Professor, Wu Han Industrial University, China. His past administration responsibilities include Dean, College of Engineering, Feng Chia University, Dean, Office of Industry-Academia Cooperation, Feng Chia University, Director, Precision Machine Research Center, Feng Chia University, Chairman, Department of Mechanical Engineering, Feng Chia University, etc. His research topics are sponsored by industry and government which are focusing on the development of modern electro-acoustic transducers, acoustics, and vibrations. His major research topics include Structural Acoustics, Active Noise Cancellation, Electroacoustic Transducer Design, High Fidelity Earphones/Loudspeakers/Microphones, MEMS Microphones, Sound Quality Evaluation, Hearing Aid, Audio Digital Signal Processing, etc.

He has earned Ph.D. degree in Mechanical Engineering from Northwestern University, USA in 1992, M.S. degree in Mechanical Engineering from University of New Mexico, USA in 1989 and B.E. degree in Mechanical Engineering from Feng Chia University, Taiwan in 1985. He has published more than 120 SCI papers in International Journals and over 100 scientific papers in International conferences worldwide. He has also authored 6 technical books. About 90 Technical Reports and 10 Patents are to his credit. He has supervised 8 Ph.D's, 61 Master's thesis and also guided 64 undergraduate projects. He has been involved in active academic and industrial consultancy since his inception at FCU. Prof. Huang's laboratory is equipped with the state of art electroacoustic equipment such as B&K Loudspeaker/Microphone/Bluetooth/Earphone/VoIP Measurement System, SoundCheck measurement system, Klippel QC system, Sound Quality Evaluation System, LOUDSOFT, and Computer Aided Analysis Software like ANSYS, COMSOL, ABAQUS, etc. Acoustic measurements at his laboratory are conducted in a state of the art Anechoic Chamber which meets ISO 3745 and 7779 standards.



Course Co-ordinator

Dr. S. J. Pawar

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