



National Institute of Aerospace Spring 2018 Featured Courses



ME 5734 – Advanced Engineering Acoustics; T/Th 3:30-4:45 pm



The fundamental principles underlying the generation, transmission and reception of acoustic waves will be presented. Methods for analytically investigating various acoustic and structural acoustic situations encountered in practice will be developed. The application of these methods to typical engineering problems with physical interpretation of the results will be demonstrated. *Prerequisite: ME 4724 (Engineering Acoustics) or permission of the instructor*

Christopher R. Fuller is a professor of Mechanical Engineering at Virginia Tech and is one of the Samuel Langley Professors at NIA. Professor Fuller is an expert in acoustics, noise and vibration control, active noise control, and control of interior noise and vibration in aerospace applications. He is a Fellow of the Acoustical Society of America and lead author of the book "Active Control of Vibration".

MAE 787 – Structural Health Monitoring; M/W 8:30-9:45 am



The course will provide the students with in-depth knowledge of technologies in structural health monitoring using smart materials as sensing and actuating elements to interrogate the structures. Damage detection techniques such as wave, impedance, and vibration-based damage detection techniques will be discussed and applied to different types on structures. Advanced signal processing techniques such as wavelet, neural network principal component analysis will be used to make the damage more quantifiable. *Prerequisite : MAE 541, 513 or equivalent*

Fuh-Gwo Yuan is a professor of Mechanical and Aerospace Engineering at North Carolina State University and is one of the Samuel Langley Professors at NIA. Professor Yuan is an expert in structural health monitoring, damage tolerance of composite structures, smart materials and structures, and fracture and life prediction of advanced materials and structures.

ECE 5502/6502 – Photovoltaics; T/Th 3:30-4:45 pm



The photovoltaics class is a one-semester course designed to provide a fundamental understanding of the subject of photovoltaics. Topics that will be covered include basic principles of photovoltaics, light absorption, charge generation and transport, p-n junctions, photovoltaic device design, fabrication and applications, light trapping structures, organic solar cells, nanomaterials for solar cells and future prospects of PV technology.

Mool Gupta is currently a Langley Distinguished Professor and Director of the NSF Industry/University Cooperative Research Center for Lasers and Plasmas at the University of Virginia. Prior to joining UVa he was the director of the Applied Research Center at the Jefferson Laboratory.

MAE 785/885 – Magnetic Suspension Technology; T/Th 3-4:15 pm



This course provides a comprehensive review of electromagnetic suspension and levitation systems, encompassing a range of technical approaches and a wide variety of applications. Examples include active and passive suspensions applied to Maglev vehicles, magnetic bearings, vibration isolators, and wind tunnel model suspensions. The course is suitable for practicing engineers, as well as graduate students, engineers, or scientists with a broad technical background wishing to learn more of this fascinating topic. Minimal prior knowledge of electromagnetic theory is assumed. The course will include some exposure to actual laboratory systems and computational analysis of electromagnetic fields & system dynamics.

Colin Britcher is a professor of Mechanical and Aerospace Engineering at Old Dominion University and serves as Director of Graduate Programs at NIA. He has many years' experience in experimental aerodynamics, particularly wind tunnel design and test techniques.