

Program

Course Description and Scope

This course is targeted at structural engineers willing to acquire some background in structural control, or to control engineers willing to understand the key issues involved in the control of lightly damped flexible structures. The attendee is assumed to have some basic knowledge in vibration and linear system theory.

The course consists of eight modules of 1h15`.

Study Material and Language

The lectures are based on the book :

Vibration Control of Active Structures, An Introduction, 3rd Edition, Kluwer, 2011 which will be distributed to participants on arrival together with a copy of the slides. All lectures and lecture notes will be in English.

Venue

The Short Course will take place at the LOEWE-Zentrum AdRIA in Darmstadt, Germany.

(www.loewe-adria.de)

Organizers

The short course will be jointly organized by the LOEWE-Zentrum AdRIA, the Rhein-Main Adaptronik e.V. and the Université Libre de Bruxelles.

Monday, 02. April 2012:

- 13:00 Welcome
- 14:00 Introduction, SMART structures, example of applications, frequency response functions, collocated systems, modal truncation
- 15:15 Coffee break
- 15:45 Transducers, actuators and sensors, energy conversion, piezoelectric transducers, piezoelectric beams and shells, piezoelectric fibers
- 17:00 Discussion

Tuesday, 03. April 2012:

- 09:00 Collocated vs. non-collocated control, pole-zero flipping, notch filters, robustness, active damping with collocated pairs (part 1)
- 10:15 Coffee break
- 10:45 Active damping with collocated pairs (part 2), Direct Velocity Feedback (DVF), Integral Force Feedback (IFF), case studies. Active damping of large trusses, cable-structures, cable-stayed bridges
- 12:00 Discussion
- 12:30 Lunch
- 14:00 Vibration isolation: Sky-hook damper, relaxation isolator, single-axis and six-axis isolator, Stewart platform, active suspension, semi-active suspension, Magneto-Rheological (MR) fluids and dampers

- 15:15 Coffee break
- 15:45 Spatial filters with piezoelectric films: discrete array sensors, modal filters, spatial aliasing, distributed PVDF films, electrode tailoring, applications in vibro-acoustics, Active Structural Acoustic Control (ASAC)
- 17:00 Discussion
- 19:00 Course dinner

Wednesday, 04. April 2012

- 9:00 Precision engineering applications: vibration control of space telescopes, active control of Extremely Large Telescopes (ELT), adaptive optics (AO)
- 10:15 Coffee break
- 10:45 Earthquake mitigation of civil structures: Den Hartog's Dynamic Vibration Absorber (DVA), Active Mass Damper (AMD) and hybrid control, use of active members
- 12:00 General discussion
- 12:30 Lunch
- 14:00 Visit of the facilities of the LOEWE-Zentrum AdRIA
- 15:30 End of the course

Evaluation and Diploma

A certificate of attendance will be given to all participants at the end of the course.

Accommodation

The participants have to book their accommodation and transport themselves. Please consult the LOEWE Website (www.loewe-adria.de) to obtain a list of local hotels and an access map to the LOEWE-Zentrum AdRIA.

www.loewe-adria.de/?Lehre:ActiveVibrationControl

Registration fee - individual price

The registration fee is as follows:

	before 01/03	after 01/03
Industry:	850€	900€
Member of the Rhein-Main Adaptronik e.V.:	400€	450€
University or Technical Colleges:	200€	250€
Member of the TU Darmstadt:	75€	125€
Member of the LOEWE-Zentrum AdRIA:	75€	125€

The fee includes a copy of the slides (paper and CD-ROM), the lunches and refreshments, as well as the course dinner. The book *Vibration Control of Active Structures* by Prof. Preumont will be distributed free of charge as part of the lecture material.

Upon registration, you will receive an invoice which has to be paid within two weeks. A fee of 50 € will be charged for cancellation after March 15, 2012.

Registration Form

First Name:

Last Name:

Institution:

Address:

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Phone:

E-mail:

Completed registration form should be sent to:

Ms. Ricarda Boehm

Email: info@loewe-adria.de

Fax: +49 6151 705 214

Deadline

The number of participants is limited, applicants will be allocated on a "first come first served" basis.



Short Course on ACTIVE VIBRATION CONTROL

by

Prof. André PREUMONT

Professor at U.L.B.

Alexander von Humboldt Awardee at TU Darmstadt

April 2 - 4, 2012

at the

LOEWE-Zentrum AdRIA

Darmstadt, Germany

Program and Registration