

REGISTRATION FORM

I wish to participate in the course
"Active Vibration Control"
SPRING 2006 - Liège

First Name

Last Name

Organization

Address

City

Zip/Postal Code

State

Country

VAT Number (if applicable)

Phone

Fax

E-Mail Address

Payments to be done by bank transfer to:

Micromega Dynamics SA

Account n° 240-0771541-07

BIC GE BA BE BB 07A

IBAN BE74 2400 7715 4107



We will not be able to accept credit card payments

*Please complete this form and return by fax to
+32/4/365.23.46*

VIBRATION CONTROL OF ACTIVE STRUCTURES

MAY 17-19, 2006

- Structural dynamics
- Smart Materials
- Piezoelectric transducers
- Actuation and Sensing
- Finite Element Modeling
- Collocated/non-collocated control
- Active Damping
- Vibration Isolation
- Semi-Active Control, MR fluids
- Cable-structures
- Spatial filters
- Vibroacoustics
- Robustness
- Applications

LOCATION

Wallonia Space Logistics (WSL)

Liege Science Park
Rue des Chasseurs Ardennais
4031 ANGLEUR, BELGIUM



Short Course on

ACTIVE VIBRATION CONTROL

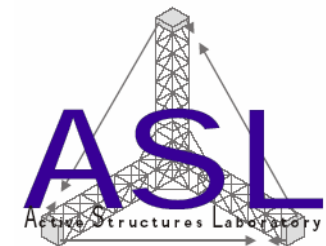
By

Prof. André Preumont

May 17-19, 2006

Liège (Angleur) - Belgium

In collaboration with



ULB



SCOPE

This introductory course is targeted at structural engineers in industry and universities willing to acquire some background in active vibration control. The course may also be useful to people involved in the modeling of smart structures and to control engineers willing to understand the key issues in structural control and piezoelectric transduction mechanisms. The applications covered during the course belong to aerospace and civil engineering, transportation and vibroacoustics.

The lectures are based on the 2 books:

Vibration Control of Active Structures, An Introduction, 2nd edition. Kluwer, 2002

Mechatronics: Dynamics of Electromechanical and Piezoelectric Systems, Springer 2006

In order to insist on the practical aspects of the problem, the course is illustrated with examples which are analyzed in detail from the point of view of modeling, control, hardware, instrumentation and technology.

ABOUT THE LECTURER

André Preumont is professor of mechanical engineering and robotics at the Université Libre de Bruxelles and director of the Active Structures Laboratory. He is also part-time professor at the Université de Liège and visiting professor at UTC, Compiègne (France).

He is the author of four textbooks in Random Vibration, Vibration Control, and Mechatronics.

He has been involved in structural dynamics and active vibration control for more than 20 years; he participated in numerous national and international research projects on active vibration control.

He was the recipient of the *Five-year FNRS Scientific Prize in Applied Exact Sciences* in 2000.

PROGRAM

Wednesday May 17

13:00 Welcome

14:00 **Module 1:** Introduction, SMART materials and structures, example of applications, frequency response, modal truncation, collocated actuators/sensors.

15:15 Coffee break

15:45 **Module 2:** Electromechanical systems, transduction mechanisms, Lagrangian dynamics, applications (AMD, geophone,...).

17:00 End day 1

Thursday May 18

9:00 **Module 3:** Piezoelectric transducers, constitutive equations, Lagrangian dynamics, piezoelectric beams and plates, modal filters, Rosen's transformer, piezoelectric fibers.

10:15 Coffee break

10:45 **Module 4:** Collocated vs. non-collocated control systems, pole-zero flipping, notch filters, robustness. Active damping with collocated pairs (part 1).

12:00 Lunch

14:00 **Module 5:** Active damping with collocated pairs (part 2), theory and applications, case studies.

15:15 Coffee break

15:45 **Module 6:** Active damping of large trusses, cable structures, cable-stayed bridges.

17:00 End day 2

19:00 Course dinner

Friday May 19

9:00 **Module 7:** Vibration isolation, sky-hook damper, single axis and 6-axis isolator, Stewart platform, active suspension, semi-active suspension, magneto-rheological (MR) fluids.

10:15 Coffee break

10:45 **Module 8:** Spatial filters, discrete array filters, modal filters, spatial aliasing, distributed PVDF films, electrode tailoring. Case studies, application in vibroacoustics.

12:00 Lunch

14:00 **Module 9:** Frequency domain analysis of SISO systems, performance specification, robustness, Bode integrals. Optimal control: Linear Quadratic Regulator, Kalman filter, separation principle, spillover, frequency shaping.

15:15 Presentation and guided tour of local companies having activities related to vibrations.

17:00 Cocktail

REGISTRATION FEE

The registration fee for university or technical colleges' representatives is €500 and €1000 for participants from industry and research centers, provided registration form is received before April 30, 2006. For late registration (i.e. after April 30), add €50 to the basic fee.

The fee includes a copy of the 2 course textbooks, a copy of the slides (paper and CD-ROM), the lunches and refreshments, as well as the course dinner.

In case of participation cancellation between May 1 and May 12, fee will not be charged, but a sum of €50 covering administrative costs will be asked for. There will be no refunding after May 12.

INFORMATION

Micromega Dynamics

Liege Science Park

Rue des Chasseurs Ardennais

B- 4031 ANGLEUR

Tél: +32/4/365.23.63

Fax: +32/4/365.23.46

E-mail : avc-short-course@micromega-dynamics.com

<http://www.micromega-dynamics.com/avc-short-course.htm>

ACCOMODATIONS & DIRECTIONS

Please consult Micromega Dynamics' Web Site.

We have negotiated discounts for this event by local hotels.