



SOI ADVANCED COURSE ON
BIOMECHANICS OF THE TREES

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FIRENZE (ITALY), 20-23 june 2011

in cooperation with:



Società Toscana di Orticoltura



sponsored by



*For information and on line application contact:
Società di Ortoflorofruitticoltura Italiana
e-mail: soifi@unifi.it*



SOI ADVANCED COURSE ON
BIOMECHANICS OF THE TREES
FIRENZE, 20-23 JUNE 2011

The course is organised by the SOI (Società di Ortoflorofrutticoltura Italiana) in cooperation with SIA (Società Italiana di Arboricoltura), Department of Agronomy and Land Management of the University of Florence and Società Toscana di Orticoltura

The Course is dedicated to PhD students, postdoc scientists, researchers, professors, technicians and municipal arborists with a sound background in plant biology and arboriculture and will give an advanced knowledge and training on basic themes as well as research results related to plant physiology and biomechanics with special focus on plant stability.

English will be the official language.

The application form is available at SOI website
<http://www.sois.it/altaformazione>

The Course will include 20 hours of lectures and 10 hours of field work distributed over 4 days.

Monday 20	Tuesday 21	Wednesday 22	Thursday 23
9.00-10.30	9.00-10.30	9.00-10.30	9.00-10.30
11.00-12.30	11.00-12.30	11.00-12.30	11.00-12.30
14.00-15.00	12.30-13.30	14.00-15.00	field work 15.00-20.00
15.00-16.00	field work	15.00-16.00	
16.30-18.00	15.00-20.00	16.30-18.00	

Participants will receive a certificate signed by the lecturers, as well as the Organizers.

Registration fees include 20 hr of lectures at Villa Bardini, 10 hours of field work in Bardini Garden and Boboli Park, working material and lunches.

SOI / SIA / ISA Members benefit of a 10% reduction in registration fees.

A get together party will be organised on Sunday 19 June from 19.30 to 22.00.

The Course will be given in the Orangerie of the Giardino Bardini, Costa S. Giorgio 2, Florence, at walking distance from the main downtown.

Course Director is Prof. Francesco Ferrini, University of Florence

Application deadline is 30 April 2011

For information and on line application contact:
Società di Ortoflorofrutticoltura Italiana
e.mail: soifi@unifi.it



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Annex 1

Main topics

Materials

Trunk structure (xylem/phloem, sapwood, heartwood, cambium, juvenile wood, adult wood, gymnosperms/angiosperms)

Cell wall structure: primary and secondary, lignin and cellulose, micro fibrillar angle

Effects of wood density

Growth of xylem and phloem and problems with secondary thickening

Basic mechanics (beam theory etc)

Mechanics of wood cells and hence wood.

The mechanics of branches: splitting and buckling

Prestressing and the control of shape: reaction wood

Mechanics of cork and bark

Tree Structures

Wind-induced stresses in trees

Branching and forking

Reconfiguration in leaves and branches: spiral grain/leaf area & size

Aerodynamics of trees and forests

Dynamics of tree sway, damping and failure

Shear and failure of hollow trunks

Failure at forks and branch shedding

Anchorage systems and root structure

Root reinforcement of soils

Hydraulics

Fluid mechanics

Tree hydraulic design

Cohesion/tension theory

Embolisms and wood design

Hydraulic limits to growth

Thigmomorphogenesis, Mechanopreception and Physiology

How do plants perceive mechanical loads

Physiological responses to bending (Thigmomorphogenesis)

Responses to unidirectional wind: flagging (wind loads around buildings and in parks?)

Detection and tree response to stress: flexure wood

Simulations and explanations for control of tree shape / Constant stress hypothesis

Control of anchorage

Overall Tree Design and Practice

Factors affecting the scaling of trees

Tree ecology, strategies and design

Implications for arborists: how to manage trees

Implications for foresters: how to prevent wind damage, improve wood quality and prevent windthrow

Techniques to Describe

Stresses and strains, mechanical measuring techniques on a macro scale

Mechanical measuring techniques on a micro scale,

Microscopy

Modelling tree growth and tree biomechanics (Functional-Structural Plant Models, Finite element analysis...)

Pressure bomb and conductivity apparatus

Tree risk assessment

Tree winching and ForestGales Wind simulation software



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Annex 2

Registration fees must be paid after communication of acceptance sent by SOI secretariat

Payment made before 30 april 2011

SOI / SIA / ISA Members*	Non SOI / SIA / ISA Members
€ 450,00	€ 500,00

Payment made after 30 april 2011

SOI / SIA / ISA Members*	Non SOI / SIA / ISA Members
€ 500,00	€ 550,00

* membership has to be validated at registration time (please, indicate membership number).

Please, take note of the deadlines for registration and remember to update your SOI / SIA /ISA 2011 membership for taking advantages by a reduced fee.

Payments must be made via Bank transfer to:
Cassa di Risparmio di Firenze - AGENZIA 1
Sesto Fiorentino (Florence - Italy)
IBAN code: IT64 A061 6038 1030 0001 1476 C00
BIC SWIFT code: CRFIIT3FXXX

To the order of:
Società di Ortofrutticoltura Italiana
Viale delle Idee, 30
50019 Sesto Fiorentino (Firenze - ITALY)

Object: Advanced Course on Biomechanics

Once arranged, a copy of the payment statement must be sent by e-mail or fax to
Francesco Baroncini - SOI Secretariat
e-mail: soifi@unifi.it; fax +39 055 4574071

Registration fees include:
20 hrs of lectures at Villa Bardini
10 hrs of field works at Giardino Bardini and Boboli Park
admission ticket to Giardino Bardini and Boboli Park
working lunches from 20 to 23 june
welcome cocktail
working material
certificate of attendance