



## COURSE SCHEDULE



### **Ecophysiology of photosynthesis: theoretical and practical approaches.**

(January 4-15, 2010, Katalapi Park, Puerto Montt, Chile).

#### **Monday January 4<sup>th</sup> (Afternoon)**

Arrival to Katalapi Park

Katalapi Park tour (temperate rain forest ecosystem)

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#### **Tuesday January 5<sup>th</sup>**

08:45-09:00 Opening remarks/General course instructions: (Bravo-Saldaña).

09:00-10:30 **Lecture 1. (León A. Bravo)** Photosynthesis: light reactions: Antenna structure and light capture Photosynthetic apparatus, electron transfer and ATP synthesis.

10:30-11:00 **Coffee Break**

11:00-12:30 **Lecture 2: (León A. Bravo)** Regulation of light capture: Light acclimation of the photosynthetic apparatus: Downregulation of PSII, Heat dissipation of excess energy, energy spill-over or state transitions.

12:30-14:00 **Lunch**

14:30-18:30 **Practical class 1 (León A. Bravo):** -Chlorophyll a fluorescence of PSII/ principles and measurements FMS II. 830 nm absorption of P700 Dual-PAM-100 measurements. Leaf absorbance index.

18:30-20:30 **Reading assignment (León A. Bravo)**  
Student's seminar preparation.

20:30-22:00 **Dinner**

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#### **Wednesday January 6<sup>th</sup>**

9:00-10:30 **Lecture 3. (Alfredo Saldaña)** Light availability gradient estimations and plant light capture.

10:30-11:00 **Coffee Break**

11:00-12:30 **Lecture 4: (Rafael Coopman):** Photosynthesis: carbon fixation, carbon metabolism C3, C4 and CAM, photorespiration.

12:30-14:00 **Lunch**

14:30-18:30 **Practical class 2**

(Alfredo Saldaña): Light measurements in the field as a tool to describe ecological patterns.

(León A. Bravo) Photorespiratory vs other electron sinks contribution to ETR.

18:30-20:30 - **Reading assignment (Coopman)**  
Student's seminar preparation.

20:30-22:00 **Dinner**

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### **Thursday January 7<sup>th</sup>**

9:00-10:30 **Lecture 5. (Alfredo Saldaña)** Responses of plants to heterogeneous light environments and evidences for the evolution of photosynthetic traits.

10:30-11:00 **Coffee Break**

11:00-12:30 **Lecture 6 (Rafael Coopman)** Modeling energy fluxes and net photosynthesis at plant level.

12:30-14:00 **Lunch**

14:30-18:30 **Practical class 3 (Hernán M. Cabrera)** -Gas exchange methods: Light and CO<sub>2</sub> response curves with simultaneous fluorescence measurements. Oxygen evolution as a tool for measuring photosynthesis and respiration.

18:30-20:30 **-Reading assignment (Saldaña-Flexas)**  
Student's seminar preparation.

20:30-22:00 **Dinner**

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### **Friday January 8<sup>th</sup>**

9:00-10:30 **Lecture 7. (Jaume Flexas)**: Regulation of carbon dioxide diffusion inside leaves.

10:30-11:00 **Coffee Break**

11:00-12:30 **Lecture 8. (Jaume Flexas)** Theory of Mesophyll conductance measuring

12:30-14:00 **Lunch**

14:30-18:30 **Practical class 4 (Bravo-Coopman)** Dual-PAM photorespiratory vs other electron sinks contribution to ETR.

18:30-20:30 **Student's Seminar 1: (Bravo-Coopman - 4 people-)**  
**Reading assignment (Adrienne Nicotra)**

20:30-22:00 **Dinner**

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### **Saturday January 9<sup>th</sup>**

9:00-10:30 **Lecture 9. (Jaume Flexas)** Combined responses of photosynthesis and respiration to water stress.

10:30-11:00 **Coffee Break**

11:00-12:30 **-Seminar 2: (Saldaña –Flexas - 4 people-)**

Brief research preparation instructions

12:30-14:00 **Lunch**

14:30-18:30 **Practical class 5 (Jaume Flexas)** Data processing for *gm* estimations

18:30-20:30 **Student's Seminar 2: (Saldaña Flexas - 4 people-)**  
**R. assignment (Adrienne Nicotra)**

20:30-22:00 **Dinner**

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**Sunday January 10<sup>th</sup>**

10:00-11:30 **Research proposals presentation and discussion**

11:30-13:00 **Ralluela Championship (Play off)**

**13:30 14:30 Lunch**

15:00-16:00 **Ralluela Championship (Finals)**

18:00-19:00 Yoga

**20:30-22:00 Dinner**

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**Monday January 11<sup>th</sup>**

9:00-10:30 **Lecture 10 (Claudio Pastenes)** Environment and energy transduction, consequences for photoinhibition.

10:30-11:00 **Coffee Break**

11:00-12:30 **Lecture11. (Jaume Flexas):** Ecophysiology of photosynthesis: an example of study in Mediterranean vegetation including regressive endemism from islands.

**12:30-14:00 Lunch**

14:30-18:30 **Practical class 6 (Pastenes-Bravo)**  
Inducción de fotoinhibición en laboratorio.  
Mediciones de fotoinhibición en campo.

**20:30-22:00 Dinner**

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**Tuesday January 12<sup>th</sup>**

9:00-10:30 **Lecture 12 (Adrienne Nicotra)** Approaches in plant comparative ecology to the study of evolutionary ecology

10:30-11:00 **Coffee Break**

11:00-12:30 **Lecture13. (Adrienne Nicotra):** Sexes patterns of photosynthesis and resource allocation in dioecious plants

**12:30-14:00 Lunch**

14:30-18:30 **Student`s Seminar 3 (Pastene, Flexas)**

18:30-20:30 Brief Research Refinement.

**20:30-22:00 Dinner**

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**Wednesday, January 13<sup>th</sup> : Research day (all professors)**

9:00-12:30 Research work/Students Proposals/ Field and Lab Measurements

**12:30-14:00 Lunch**

14:30-19:00 Research work/Students Proposals/ Field and Lab Measurements

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**Thursday January 14<sup>th</sup>**

9:00-10:30 **Lecture 14 (Nicolás Franck)** Photosynthetic limitations of evergreen and deciduous fruit trees

10:30-11:00 **Coffee Break**

11:00-12:30 **Student's seminar 4 (Saldaña Nicotra)**

**12:30-14:00 Lunch**

14:30-16:30 **Student's Seminar 5 (Saldaña Nicotra)**

16:30-20:30 Data processing and reports elaboration.

**20:30-22:00 Dinner**

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**Friday January 15<sup>th</sup>**

9:00-10:30 **Lecture 15 (Adrienne Nicotra)** Plant physiological responses to defoliation

10:30-11:00 **Coffee Break**

11:00-12:30 **Presentations of Student's research reports (working groups)**

**12:30-14:00 Farewell Lunch**

**Final Remarks**

**Return Trip**

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