

Department of Life Science  
and Center for Tropical Ecology and Biodiversity,  
Tunghai University, Taichung

## **Pierre Legendre**

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WWW page for free software: <http://www.bio.umontreal.ca/legendre/indexEn.html>

WWW pages for this course : <http://biol09.biol.umontreal.ca/Taichung09/>

## **Biostatistics Short Course**

### **Part 1: Linear model**

*Venue: Tunghai University, Taichung*

November 6-8, 2009

**Day 1**, starting at 1:30 p.m.

1. Variance, covariance, correlation.
2. Simple linear regression, model I.
3. Model II regression.

**Day 2**, starting at 9:00

4. Statistical testing by permutation.
5. Comparison of two samples:  $t$ -test.
6. Model I anova (fixed-effect model), one-way (one factor).

**Day 3**, starting at 9:00

7. Nested anova
8. Two-way anova, Model I
9. Two-way anova, Models II and III
10. General linear model.

**⇒ The lectures will be followed by practicals using the R statistical language.**

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## **Biostatistics Short Course**

### **Part 2: Community ecology ordination**

*Venue: Tunghai University, Taichung*

November 13-15, 2009

**Day 1**, starting at 1:30 p.m.

1. Introduction to data analysis.
2. Ordination in reduced space: principal component analysis (PCA), correspondence analysis (CA), principal coordinate analysis (PCoA).
3. Transformation of species abundance data tables prior to linear analyses.

**Day 2**, starting at 9:00

4. Measures of similarity and distance, especially for community composition data.
5. Multiple regression. R-square and adjusted R-square.

**Day 3**, starting at 9:00

6. Forward selection of environmental variables in regression and RDA.
7. Partial regression and variation partitioning.
8. Canonical redundancy analysis (RDA) and correspondence analysis (CCA).
9. Multivariate analysis of variance by canonical analysis.

**If time allows:** Mantel and Anosim tests. Power comparison, Mantel *versus* RDA.

**⇒ The lectures will be followed by practicals using the R statistical language.**