The Italian Econometric Society (SIde) in collaboration with the Venice centre in Economic and Risk Analytics for Public Policies (VERA) Ca' Foscari University of Venice organizes the course for PhD students in:

**Networks Econometrics**

*28 June - 3 July 2021*

**Coordinator**
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**Lecturers**
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**Course Outline**

1. Graph Theoretic Foundation of Networks
   1.1 Definitions
1.2 Graph Connectivity
1.3 Multilayer-networks
1.4 Tutorial 1: Introduction to R (Data manipulation and regression)
1.5 Tutorial 2: Network mapping and visualisation in R
1.6 Tutorial 3: Text mining and visualization in R

2. Network Extraction Methods
   2.1 Graphical Models
   2.2 Parametric sparse regression models
   2.3 Nonparametric sparse regression models
   Tutorial 4: Extraction of Financial Networks in Matlab
   Tutorial 5: Network visualization with Gephi

3. Temporal Network Models
   3.1 Tensor decomposition
   3.2 Dynamic Tensor Models
   3.2 Markov-switching Tensor Models
   Tutorial 6: Application to COMTRADE and Financial Networks in Matlab

4. Multi-layer Network Models
   4.1 Definition and analysis
   4.2 Extraction
   Tutorial 7: Application to Oil Linkages Networks in Matlab

5. Stochastic-Block Models
   5.1 Definition and inference
   5.2 Application to Financial Networks
Reference textbooks and suggested readings:

Introductory references

- Bollobas, B. (1998), Modern Graph Theory, Springer.

Further references

- Jensen, F. (1996), An Introduction to Bayesian Networks, Springer-Verlag

SOFTWARE USED FOR THE APPLICATIONS: MATLAB and R

Participants will use their laptops with MATLAB, R and GEPHI already installed on them.

Venue and timetables

The Course requires full-time attendance, and participation is not compatible with other jobs at the same time (e.g. preparation of other exams). Lectures and tutorials will be in English, with the following schedule (provisional):

- Monday to Friday: lectures: 9.00-13.00, 15.00-18.00.
- Saturday: lectures: 9.00-13.00.

Fees and Enrollment

- Students, new graduated students, PhD students and temporary university staff: 340 euro
- University staff: 450 euro
- Others: 1500 euro

In case of enrollment in two or more courses, for a maximum of three, Student and Staff participants are entitled to a discount of 100 euros on each course. Other participants are entitled to a discount of 300 euros on each course.

* The amount due by Master and PhD students from University of Ca' Foscari is 30 euro, since the rest of the fee is sponsored by the Venice centre in Economic and Risk Analytics for Public Policies (VERA)
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Sponsors

- VERA Center at University Ca’ Foscari of Venice