Course offered for the PhD program
in Civil, Chemical and Environmental Engineering
Curriculum in Fluid Dynamics and Environmental Engineering – a.a. 2013/2014
(XXIX ciclo)

(possibility of participation for students in other PhD cycles or other PhD courses)

1. Title
Hydrodynamic stability

2. Course Description
The course is a short introduction to hydrodynamic stability theory, mainly focusing on modal analysis, and covers the basic concepts regarding temporal stability of parallel shear flows in the context of incompressible flows. Moreover, numerical exercises will be given in order for the students to apply and test the presented theory. The theoretical part can be outlined as follows :

- Introduction of linear stability theory in the in the context of receptivity and transition from laminar to turbulent flow
- A brief outline regarding the history of hydrodynamic stability analysis-- Basic definitions of stability
- Temporal inviscid stability theory
- Temporal viscous stability theory
- A brief introduction to nonmodal stability analysis
- Examples from different fields of fluid mechanics

3. Course Organization
The course is given as classroom lectures.

4. Teacher
The course is held by Prof. Jan Oscar Pralits

5. Duration and credits
The course is composed of 10 hours of lectures corresponding to 2 credits.

6. Activation mode and teaching period
The course is annual and will take place from July 7th to July 11th 2014.

7. Deadline for registration
The participants should inform the lecturer by email before the 30th of June 2014: jan.pralits@unige.it

8. Final exam
Written examination (solution of a simple problem) immediately at the end of the lectures.