Learning outcomes
The course emphasizes the importance and need of the integrated management of plant diseases within the integrated pest management approach, with the least possible disruption to the agro-ecosystems and the least hazard to people, animals, and environment. The course will enable the students: to acquaint with the principles of an integrated approach to plant disease management; to become familiar with the basic principles involving fungal, bacterial, phytoplasma and viral based diseases in plants; to acquire knowledge of the environmental factors influencing plant diseases, to gain an understanding of the influence of plant pathogens in crop-ecology finalized in rationalise disease control; to know the most successful plant protection strategies by physical, genetic, cultural, chemical and biological means; to gain knowledge of the use of predictive models.

Course contents
The mission of the course is addressed to the study of the integrated plant disease management strategies that incorporate conventional and novel biological, cultural, chemical, genetic and other environmentally sound and economically profitable approaches. Discussion of the principles of managing insects, diseases in the context of developing stable agricultural systems. During the course it will be provided the basis of understanding, interpretation, selection, development and application of the most effective methods of Integrated Crop Management, with the least disruption to the environment. A more detailed understanding of the effects of pest pressure on crop productivity and the development of threshold levels for action will be developed.

The course will provide the main elements involved in the integrated plant disease management: Exclusion — keep pathogens, vectors and infected plants out of disease-free areas. Eradication — destroy a disease organism after it has become established (destruction of infected plants, disinfection of storage bins, containers and equipment, and/or soil disinfection by fumigation, pasteurization, solarization or drenching). Protection — use a physical barrier such as a row cover or chemical applications available to prevent a disease from becoming established. Resistance — plant resistant varieties. Therapy — use chemicals that are systemic in the plant. Avoidance — use good cultural practices such as planting date selection, seedbed preparation and water management to avoid disease.

Evaluation of the benefits and risks of the treatments and choose the best solution with the least negative environmental impact. The challenge, when using pesticides, is to pick the one that will cause the least harm to non-target organisms in the forest or landscape.

Discussion of the new scenario of crop protection created by the policy on the use of pesticides started 20 years ago by the European Union to reduce their impact on health and environment. It is a topic that should be known since the new legislation for crop protection is becoming a very complex practice, because it is based on technical means more and more difficult to use also for legislative limitation. The EU policy is changing the regulatory framework for the homologation and use of products for plant protection in member states and this will have an impact in the different European countries.

Readings/Bibliography
Handouts and selected paper will be given to the students during the lecture by the instructor.

Teaching methods
The course will be subdivided in two parts:

The first concentrated on the different control methods of the main plant pathogens, giving more emphasis and preference to host-resistance, cultural practices and biological control other than the use of pesticides.

The second part in the laboratory for the identification of the main pathogens and better study the most advanced methods to control plant pathogens responsible of the most important crop diseases.

Assessment methods
Assessment methods:
At the end of a course it will be a final exam that tests the acquired knowledge and abilities. The students should produce a power point presentation on a subject chosen with the instructor of about 15 minutes long. Then questions on the main subjects of the course will follow. The final grade will be calculated by arithmetic mean among the integrated courses.

**Teaching tools**
PC, slide projection and handouts

**Office hours**
See the website of Pisi Annamaria