# .- General Agronomy

## Prof. Vincenzo Tabaglio

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

 The course aims to provide students from different backgrounds with the basic notions to be able to interpret and manage the natural phenomena, operational processes and fundamental techniques that regulate agricultural production.

 **Intended learning outcomes**: at the end of the course, students will be able to understand the physical, chemical and biological dimensions of the soil-plant-atmosphere interactions, which underlie the innovative agroecosystems based on agroecological, environmental and economic sustainability. With this background, the student will be able to correctly interpret the specific characteristics of the farm in which he will work, adopting and adapting the best sustainable agrotechnics towards the conservation agriculture.

***COURSE CONTENT***

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|  | ECTS |
| **Agronomy and Agricultural Production** |  |
| Definitions of Agronomy. Agricultural productivity factors. The modelling approach. Agroecology and the sustainability of the agroecosystem. Principles of the Conservation Agriculture (or Sustainable Agriculture) | 0.5 |
| **Climate and Agriculture** |  |
| The importance of climate in agriculture. Radiation; temperature; rainfall. The process of evapotranspiration. The estimation of evapotranspiration with FAO formulas. | 1.0 |
| **The Agricultural Soil** |  |
| Generality and stratigraphy; soil texture and structure; other physical properties. Soil hydrological properties. Chemical properties: pH; CEC; salinity; nitrogen; phosphorus; potassium; other meso- and micronutritive elements. | 1.0 |
| **Soil Tillage** |  |
| Land reclamation and soil tillage. Land clearing. Primary tillage: ploughing; non-ploughing techniques. Secondary tillage: seedbed preparation. Cultivations. Tillage implements. Transition to no-till. Conservation tillage systems. Effects on soil biology and health. | 1.0 |
| **Irrigation. Erosion Control** |  |
| Aims, systems and methods of irrigation. Land modelling and drainage. Erosion control. Estimating erosion with the RUSLE equation. | 0.5 |
| **Soil Organic Matter** |  |
| Functions and dynamics of soil organic matter. Farmyard manure, livestock slurries. Composts, sewage slurries, other organic wastes. | 1.0 |
| **Fertilisation and Manuring** |  |
| Principles of organic and mineral fertilisation. The quantitative and qualitative response of crops to fertilisation. The fertilisation plan. Nutrient use efficiency. Spreading methods and practices. Fertigation. Risks and environmental constraints. | 1.0 |
| **Weeds and Weed Control** |  |
| Weeding: general principles. Agronomic tools for sustainable weed control. Agronomic effects of weeding. Allelopathic cover crops. | 0.5 |
| **Crop Rotation. Seed Production** |  |
| Intercropping and crop-rotation. Cover crops. Green manure. The seed. Seed crops. The quality characteristics of the seed. | 0.5 |
| **Tutorials** |  |
| Educational visits and classroom tutorials. | 1.0 |

***READING LIST***

Paris P.,2003. *Elementi di Agronomia generale,* I.S.U., U.C.S.C., Milan.

Ceccon P. *et al*. (Eds.), 2017. *Agronomia*. EdiSES, Naples.

Giardini L., 2012. *L’agronomia per conservare il futuro.* Pàtron Editore, Bologna.

Gregory PJ, Nortcliff S., 2013. *Soil Conditions and Plant Growth*, Wiley-Blackwell, Oxford, UK.

Further reading references for the individual topics will be provided during the course.

***TEACHING METHOD***

Frontal lectures, where the main topics of the course will be addressed with the aid of PowerPoint presentations.

In-depth seminars held by lecturers, technicians or experts in the sector.

Frontal tutorials during which students will be given practical exercises to solve according to the methods seen during lectures. The slides used in the lectures and tutorials will be made available at the end of each lesson on the Blackboard platform.

Educational visits to farms, research institutes and other companies in the sector, where some of the topics addressed in lectures will be analysed in detail.

***ASSESSMENT METHOD AND CRITERIA***

Final written exam. The written test consists of 10 open-ended questions, with a balanced mix of synthetic or in-depth, mnemonic or reasoning requests.; each answer carries a maximum mark of 3/10. On the other hand, any answers not given carry neither a mark nor a penalty. The maximum overall mark is 30/30, while the minimum mark to pass is 18/30. The duration of the test is 60 minutes. During the exam students are allowed to use a calculator.

The exam is designed to assess primarily the student's reasoning ability and analytical rigour with respect to the course subjects, as well as their communication skills and command of the language.

The assessment results will be reported on the student's personal page, and they will have 5 days to either accept or refuse the mark assigned.

***NOTES AND PREREQUISITES***

For a fruitful understanding of the topics covered during lectures, the student must possess a basic knowledge on the areas of botany, soil chemistry and plant physiology.

Information on office hours available on the teacher's personal page at <http://docenti.unicatt.it/>.