001-2-2006
2 credits

Suggested academic course: **Principles in root development, plants nutrition and biogeochemistry**

Lecturers: Ran Erel, Naftali Lazarovitch

The proposed course aims to provide the students with basic scientific knowledge relating to plants' nutrients chemistry, acquisition pathways, transport, and assimilation within the plants. We will focus on general information on root development and the major macro and micro-nutrients, acquisition pathways, and implications on plant performance.

1. **Basics:** introducing the 17 essential plant minerals. Plant responses to nutrients. Diagnosis and interpretations of plant and soil analysis
2. **Root development and nutrients uptake pathways:** root development, nutrients diffusion, and transport.
3. **Nitrogen:** N forms and chemical processes in soil (nitrification, mineralization, run-off, de-nitrification).
4. **Phosphorus**, basic chemistry, root adaptation and modification, Mycorrhiza fungi.
5. **Potassium:** K uptake, transport, and role in plants and under abiotic stress.
6. **Calcium and magnesium.** Ca uptake, transport, and Ca related physiological disorders (e.g., blossom-end rot)
7. **Micronutrients.** Introduction, chelates, iron acquisition.
8. **Case study:** Holistic approach to olive nutrition

Structure of Final Course-Grade: Practical assignments (20%); exam (80%).

Recommended Reading:

Marschner, H. (Ed.). (2011). *Marschner's mineral nutrition of higher plants*. Academic press.