




4.00 credits

22.5 h + 22.5 h

Q1

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|---------------------|---|
| Teacher(s)          | Agnan Yannick ;Delmelle Pierre (coordinator) ;Hardy Brieuc (compensates Delmelle Pierre) ;  |
| Language :          | French<br>> English-friendly  |
| Place of the course | Louvain-la-Neuve  |
| Prerequisites       | - Introduction aux sciences de la Terre [LBIR1130]<br>- Introduction à l'ingénierie de la biosphère [LBIR1230]<br>- Sciences du sol et excursions intégrées [LBIR1336]  |
| Main themes         | - Soils as bio-physico-chemical reactors at the interface between the lithosphere, biosphere, hydrosphere, and atmosphere<br>- Pedological processes governing soil formation and functioning<br>- Physico-chemical reactions which underpin the response of soils to natural and anthropogenic perturbations   |
| Learning outcomes   | <b>At the end of this learning unit, the student is able to :</b><br><br>a. Contribution of the activity to the framework AA<br>M1.1, M1.2, M1.3, M1.4, M1.5<br>M2.1, M2.2, M2.3, M2.4<br>M3.4<br>M6.2, M6.5<br><br>b. Expected learning outcomes<br>1 At the end of the activity, the student is able to:<br>- Describe the pedological processes governing soil formation and functioning<br>- Explain the physico-chemical reactions which underpin the response of soils to natural and anthropogenic perturbations<br>- Determine the factors and processes responsible for the variability of soil properties<br>- Assess the response of soil to natural and anthropogenic perturbations |
| Evaluation methods  | - Group project report<br>- Open book written exam  |
| Teaching methods    | - Face-to-face classes<br>- Field group project<br>- Field excursion<br>- Applied problems  |
| Content             | 1. Introduction<br>2. Soil acidity<br>3. Soil weathering and formation<br>4. Dynamics of soil organic matter<br>5. Sorption reactions<br>6. Redox reactions<br>7. Soil development<br>8. Case studies   |
| Inline resources    | Lecture notes and other teaching resources available on Moodle  |
| Bibliography        | Blume H.-P., Brümmer G.W., Fleige H., Horn R., Kandeler E., Kögel-Knabner I., Kretschmar R., Stahr K., Wilke B.-M. (2016). Scheffer/Schachtschabel soil science. Springer, Berlin. 618 p.<br>Weil R.R., Brady N.C. (2017). The nature and properties of soils. Pearson, Harlow. 1104 p.<br>Calvet R. (2013). Le sol. France Agricole, Paris. 678 p.<br>Calvet R., Chenu C., Houot S. (2015). Les matières organiques des sols. France Agricole, Paris. 304 p.   |

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| Other infos                 | This course can be given in English. |
| Faculty or entity in charge | AGRO                                 |

| <b>Programmes containing this learning unit (UE)</b>  |         |         |              |   |
|---|---------|---------|--------------|---|
| Program title   | Acronym | Credits | Prerequisite | Learning outcomes   |
| Master [120] in Forests and Natural Areas Engineering | BIRF2M  | 4       |              |  |
| Master [120] in Environmental Bioengineering          | BIRE2M  | 4       |              |  |
| Master [120] in Agriculture and Bio-industries        | SAIV2M  | 5       |              |  |