### Degree competences to which the subject contributes

**Specific:**
2. Fundamentals of geology and land morphology and ability to apply them in problems related to engineering.
   Climatology.

**Transversal:**
1. **EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1.** Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.

### Teaching methodology

The hours of learning aimed consist, firstly, to lectures (large group) in which teachers made a exhibition to introduce the learning objectives related to general concepts of the matter, trying to motivate and involve the students to participate actively in their learning. Athenea and other support material is used. Also, they are classes of problems and case studies of agri-environmental themes where students work in groups.

Before conducting the practices, students must have made a reading of the scripts and the material that teachers have prepared so that students know the objectives. In general, after each meeting tasks outside the classroom, that should work either individually or in groups, are proposed. They are the basis of the activities conducted.

These activities of small groups evaluate the efficacy of oral communication of students in two periods (one initial target and another student advanced course to assess progress in this competition).

We must also consider other hours of independent learning such as those engaged in directed readings, problem solving proposed questionnaires or self-learning content using different virtual campus ATENEA or other support.

### Learning objectives of the subject

It is intended that the student with a scientific view of the overall importance of lithological material, morphology of the
terrain, soil and climate as factors limiting food production and land management. You will be able to acquire the basic terms of agroclimatology own, geomorphology, lithology, mineralogy and the soils and understand the main physical and chemical properties of soil and water relations of soil-plant-atmosphere. This has allowed them to evaluate the status and problems of the variables related to the edaphic environment, climate and relief, and use them in the resolution of appropriate cases to the practice of agricultural sciences.

### Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>Hours medium group:</th>
<th>Hours small group:</th>
<th>Guided activities:</th>
<th>Self study:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40h</td>
<td>0h</td>
<td>20h</td>
<td>0h</td>
<td>90h</td>
</tr>
<tr>
<td></td>
<td>26.67%</td>
<td>0.00%</td>
<td>13.33%</td>
<td>0.00%</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
## INTRODUCTION TO THE ATMOSPHERE PLANT, SOIL, ROCK SYSTEM

**Learning time:** 3h  
- Theory classes: 2h  
- Self study: 1h

### Description:
- Introduction to the subject: Components of terrestrial ecosystems and their influence on the life of man.  
- Influence of climate.  
- General functions of soils

### Related activities:
- Activity 1: Class of theoretical explanation.  
- Activity 2: Individual final assessment test

## ATMOSPHERE AND AGROCLIMATIC VARIABLES

**Learning time:** 30h 40m  
- Theory classes: 9h  
- Laboratory classes: 4h  
- Self study: 17h 40m

### Description:
- Effect of climate and weather on agricultural production.  
- Composition and structure of the atmosphere.  
- Other atmospheric variables (air pressure, wind, ...)

### Related activities:
- Activity 1: Class of theoretical explanation.  
- Activity 2: Individual final assessment test  
- Activity 3: Problems and exercises with meteorological variables  
- Activity 5: Estimation of evapotranspiration  
- Activity 8: Questionnaires on paper and / or Moodle
## CLIMATE CLASSIFICATIONS

**Description:**
The criteria necessary to perform a classification climate
Major indices and weather charts
Major climatic classifications

**Related activities:**
- Activity 1: Class of theoretical explanation
- Activity 2: Individual final assessment test
- Activity 5: Climatic Classifications
- Activity 8: Questionnaires on paper and / or Moodle

**Learning time:** 19h
- Theory classes: 4h
- Laboratory classes: 4h
- Self study: 11h

## GEOLOGY AND MORPHOLOGY OF LAND

**Description:**
Description of the main types of minerals and rocks. Important minerals in soils and its main functions.
Study of the rocks of the Mediterranean. Alteration of rocks and soil formation processes.
Importance of physiography and forms of relief.
Effects of original material in soils: granulometry and texture, nutrients, color.

**Related activities:**
- Activity 1: Class of theoretical explanation.
- Activity 2: Individual final assessment test
- Activity 5: Solving problems and case study of Geology and soils.
- Activity 6: Laboratory Activities
- Activity 7: Questionnaires on paper and / or Moodle

**Learning time:** 38h
- Theory classes: 5h
- Laboratory classes: 6h
- Self study: 27h
### SOIL SCIENCE

<table>
<thead>
<tr>
<th>Learning time: 59h 20m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 20h</td>
</tr>
<tr>
<td>Laboratory classes: 6h</td>
</tr>
<tr>
<td>Self study: 33h 20m</td>
</tr>
</tbody>
</table>

### Description:
- Morphology and soil components.
- Soil Water. Soil solution.
- Ion exchange. CIC. Cation exchange. Sodicitat. Soil pH.

### Related activities:
- Activity 1: Class of theoretical explanation.
- Activity 5: Solving problems and case study of Geology and soils.
- Activity 6: Laboratory Activities
- Activity 7: Questionnaires on paper and / or Moodle
### Planning of activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Hours</th>
<th>Support materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(ENG) ACTIVITY 1: THEORY LESSONS</strong></td>
<td>Theoretical explanation class</td>
<td><strong>82h</strong>&lt;br&gt;Theory classes: 38h&lt;br&gt;Self study: 44h</td>
<td>Statements of the two parts. Standard tables or classifications.</td>
</tr>
<tr>
<td><strong>(ENG) ACTIVITY 2: FINAL INDIVIDUAL TESTS</strong></td>
<td>Individual evaluation in the classroom about the indispensable theoretical concepts. Resolution of exercises related to the subject learning objectives. The evaluation will be corrected by teachers</td>
<td><strong>2h</strong>&lt;br&gt;Theory classes: 2h</td>
<td>Dossiers of theoretical and practical classes will be made by the teacher. They will be available at ATENEA</td>
</tr>
<tr>
<td><strong>(ENG) ACTIVITY 3: PROBLEMS AND EXERCISES USING METEOROLOGICAL VARIABLES</strong></td>
<td>Two two-hour classroom sessions. Students will solve exercises about solar radiation, energy balance of the Earth, and water content in the atmosphere. The students will solve a brief questionnaire related to the basic concepts at the beginning of the session. The students will work individually on the proposed exercises and they must be delivered to the teacher at the end of the session.</td>
<td><strong>10h</strong>&lt;br&gt;Laboratory classes: 4h&lt;br&gt;Self study: 6h</td>
<td>Dossiers of theoretical and practical classes will be made by the teacher. They will be available at ATENEA</td>
</tr>
<tr>
<td><strong>(ENG) ACTIVITY 4: ESTIMATION OF EVAPOTRANSPIRATION - CLIMATOLOGIC CLASSIFICATIONS</strong></td>
<td>At the end of the activity student must be able to:&lt;br&gt;- carry out energy balances&lt;br&gt;- relate the different parameters involved in the atmospheric water vapor content</td>
<td><strong>13h</strong>&lt;br&gt;Laboratory classes: 4h&lt;br&gt;Self study: 9h</td>
<td></td>
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</tbody>
</table>

**Theory classes:** 2h  
**Laboratory classes:** 4h  
**Self study:** 4h  
**Hours:** 84h  
**Total:** 104h
**Description:**
Two sessions of two-hour classroom lessons. The students will work individually exercises about reference evapotranspiration and climatic classifications. At the beginning of the sessions students must answer a brief questionnaire related to the basic concepts. The students will work different exercises, which will be delivered to the teacher at the end of the session.

**Support materials:**
Dossiers of theoretical and practical classes will be provide by the teacher. They will be available at ATENEA.

**Descriptions of the assignments due and their relation to the assessment:**
Students must answer the questionnaire at the moment indicated by the teacher. At the end of the activity they have to deliver the proposed exercises. The teacher will control attendance. Student participation and the resolution of the exercises will be valued.

**Specific objectives:**
At the end of the activity students will be able to:
- determine reference evapotranspiration
- know how to do a climate classification

<table>
<thead>
<tr>
<th>(ENG) ACTIVITY 5: RESOLUTION OF PROBLEMS OF GEOLOGY AND EDAFOLOGY</th>
<th>Hours: 25h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory classes: 8h</td>
<td>Self study: 17h</td>
</tr>
</tbody>
</table>

**Description:**
The teaching methodology used will be expositive and participative. Different exercises will be solved. Some aspects about geology and morpholoy of an area will be treated as well as description and classification of soils.

**Support materials:**
Some exercises will be solved during the activity. They will have to be delivered to the teacher. Topic notes will be found at ATENEA. A guideline will be done.

**Descriptions of the assignments due and their relation to the assessment:**
The solved exercises and the cases proposed must be individually delivered to the teacher. After correcting they will be returned.

**Specific objectives:**
At the end of the activity the student should be able to:
- calculate basic parameters of the physical characteristics of the soils (texture, porosity, bulk density)
- quantify the soil water content, using the standard nomenclature
- relate the energy states of the soil water withs its practical application

<table>
<thead>
<tr>
<th>(ENG) ACTIVITY 6: LABORATORY</th>
<th>Hours: 15h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory classes: 4h</td>
<td>Self study: 11h</td>
</tr>
</tbody>
</table>

**Description:**
The activity is done in the laboratory. It is about geology and soil science. Before carrying out the practice, the students must have done a previous reading of the guideline and the documents that the teacher has prepared. The students must have answer the corresponding report than includes specific questions, the results obtained in the practical activity and an evaluation of them.
Support materials:
All the material and reagents necessary for the activity. A detailed guideline, the report and notes of the subject will be available at ATENEA.

Descriptions of the assignments due and their relation to the assessment:
The teacher will verify the activity results at the end of the session and they will be returned to the students with the corresponding feedback. The oral expression capacity of the students will be evaluated through an oral presentation of the results or some subject related to the activity.

Specific objectives:
At the end of the sessions the student should be able to:
- Identify characteristics of solid components of the soil
- Characterize chemical properties of soils
- Understand the results obtained

(ENG) ACTIVITY 7: TESTS

Description:
Questionnaires made in paper or in the digital campus on the contents 2, 3, 4 and 5. They will be corrected by teachers.

Support materials:
Self-study test series with multiple options and subject notes will be available at ATENEA. Basic and specific bibliography of the contents of the subject.

Descriptions of the assignments due and their relation to the assessment:
The answered questionnaire. Its qualification participates in the continuous assessment process.

Specific objectives:
At the end of the activity the student should be able to:
- know the basic concepts on lithology, morphology of the land, the edaphic environment and climatology
- apply this knowledge to practical cases

Qualification system

N1: Qualification assessment testing: Weight of each part of the program: 2/3 correspond to Geology and Soil Science and 1/3 corresponds to climatology. This note will be reached between the partial and final exam.

N2: Qualifications of the continuous assessment: Exercises and laboratory sessions related to Geology and Pedology: 2/3 of the percentage corresponding to practical sessions; Exercises of applied climatology: 1/3 of the percentate corresponding to practical sessions

Nfinal: 0,75N1 + 0,25N2

Regulations for carrying out activities

Practical activities are compulsory and the delivery of reports correctly answered is required to pass the course. Reports must be submitted by the deadline.
Bibliography

Basic:


