COURSE DESCRIPTION

GEOLOGY

Degree on Environmental Sciences
University of Alcalá

Academic year 2019/120
1st year – 2nd semester

Aprobada en Junta de Facultad 23/05/19
1. INTRODUCTION

Environmental Sciences is a multidisciplinary subject, as it is the study of both the environment (biotic and abiotic) and human environmental use. Understanding this complex natural system requires a thorough knowledge of each of the topics, one of which is abiotic physical environment: the Earth, its features and characteristics. Geology is the science that deals with the study of Earth, and the characteristics of its materials, the processes occurring both on the surface and inside the planet, and landforms resulting from these processes.

Environmental Sciences requires an extensive understanding of the processes occurring inside the Earth, and of the models that explain them; the internal dynamics which can explain the current configuration of continents and their evolution over geologic time; the processes leading to the formation of mountain ranges and sedimentary basins; the water cycle and fluvial, coastal, and glacial processes and the landforms they generate; natural resources that can be used, or the processes that may be dangerous to humans or their infrastructures. Having a detailed knowledge of these aspects is the main objective of this course, as they are necessary to develop the necessary skills of environmental analysis and planning.

This course also aims to facilitate a detailed knowledge of geological techniques, that are beneficial when applying for jobs in a laboratory and/or the field, and that are necessary to analyze and understand the characteristics of the relief, of the constituent materials and processes occurring in the surface of the planet or inside it, based on the concepts described above.
Knowledge provided by Geology is fundamental in order to learn about other issues of the Environmental Sciences such as Edafology, Botanic, Ecosystems, Hydrology and Hydrogeology, Land management, among many others.

**Prerequisites:** None  
**Recommendations:** None  
**Limitations:** 20 students  
**NOTE:** The use of laptops, tablets and mobile phones is not allowed in the classroom and laboratory for this course.

### 2. SKILLS

**Generic skills:**

**Instrumental:**

1. Capacity for analysis and synthesis  
2. Basic general knowledge  
3. Knowledge of a foreign language  
4. Ability of manage information (ability to obtain and analyze information from different sources)  
5. Ability to solve problems

**Interpersonal:**

6. Criticism and Self-criticism  
7. Ability to develop teamwork  
8. Ability to work in an interdisciplinary team  
9. Skills in interpersonal relations  
10. Understanding and respecting the views of others

**Systemics:**

11. Ability to practically apply knowledge  
12. Research skills  
13. Ability to generate new ideas  
14. Ability to self-employment  
15. Production of quality work  
16. Initiative and entrepreneurship  
17. Awareness of environmental issues

**Specific skills:**

1. An understanding of the concepts, principles, processes and general geological theories.  
2. Identification and assessment of the geological characteristics of the physical environment.  
3. Evaluation, interpretation and synthesis basic geological information from the field and on geological maps.  
4. Analysis and interpretation of geomorphological information from the field on geomorphological mapping and vertical aerial photographs.  
5. Diagnosis of the role of geology in environmental science and land uses.  
6. Identification of environmental problems and natural hazards related to geology.  
7. Catalogue and evaluate geological resources.
# 3. SYLLABUS

<table>
<thead>
<tr>
<th>Syllabus</th>
<th>Total of hours</th>
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<tbody>
<tr>
<td><strong>Section I: Introduction to Geology</strong>&lt;br&gt; 1. Introduction to Geology</td>
<td>20 hours</td>
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<tr>
<td><strong>Section III: Structure and inner dynamics</strong>&lt;br&gt; 7. Earth’s interior&lt;br&gt; 8. Earth’s inner dynamics&lt;br&gt; 9. Seafloor spreading&lt;br&gt; 10. Crustal deformation</td>
<td>12 hours</td>
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<tr>
<td><strong>Section IV: Earth history</strong>&lt;br&gt; 11. Geological time&lt;br&gt; 12. Geological history of the Earth</td>
<td>12 hours</td>
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<tr>
<td><strong>Lectures</strong>&lt;br&gt;(Classroom)</td>
<td>20 hours</td>
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<tr>
<td><strong>Seminars</strong>&lt;br&gt;(Classroom)</td>
<td>12 hours</td>
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<tr>
<td><strong>Practices</strong>&lt;br&gt;(Laboratory)</td>
<td>24 hours</td>
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<tr>
<td><strong>Fieldtrip</strong></td>
<td>8 hours</td>
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Geology (1st CCAA)<br>Revisado el 20/05/2019. Consulte la última versión aprobada en página [web del Grado](http://www.webdelgrado.com)
### Schedule (indicative)

<table>
<thead>
<tr>
<th>Week</th>
<th>Contents</th>
<th>Group tutorials</th>
<th>Exams (test)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Lectures</td>
<td>Seminars</td>
<td>Practices</td>
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<td>9 &amp; 10</td>
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<td>7th</td>
<td>11 &amp; 12</td>
<td>6 &amp; 11 &amp; 12</td>
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<tr>
<td>8th</td>
<td>13 &amp; 14</td>
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<tr>
<td>11th</td>
<td>19 &amp; 20</td>
<td>10</td>
<td>8</td>
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</tbody>
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### 4. TEACHING-LEARNING-FORMATIVE ACTIVITIES METHODS

#### 4.1. Credits distribution (on hours)

**Hours of attendance:**
- 64 hours distributed on:
  - Lectures: 20 h
  - Seminars: 12 h
  - Practices: 24 h
  - Fieldtrip: 8 h

**Hours of personal study:**
- 125 hours dedicated by the student:
  - To study the theoretical contents
  - To solve exercises
  - To prepare and write reports
  - To complete on-line activities

**Exams**
- 8 hours divided into:
  - Test exams: 2 h
  - Practical exam: 3 h
  - Final exam: 3 h

**Group tutorials**
- 3 hours (2 sessions of 1.5 h)

**Individual tutorials**
- All required by the student

**Total hours**
- 200 hours

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*Geology (1st CCAA)*

Revisado el 20/05/2019. Consulte la última versión aprobada en página [web del Grado](#).

Aprobada en Junta de Facultad 23/05/19
## 4.2. Methodological strategies, materials and didactic resources

<table>
<thead>
<tr>
<th>Methodological strategies</th>
<th>Lectures. Explanation of the most important concepts, theories, and models of the geology and their relation to the Environmental Sciences.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Seminars. Explanation of the basic geological methodologies applied to Environmental Sciences.</td>
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<tr>
<td></td>
<td>Exercises. Activities to be solved by the student in order to apply and complete their theoretical knowledge of the Geology and the geological methods.</td>
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<td></td>
<td>Practices. Laboratory exercises to learn the geological methods, and to identify different rock-forming minerals and rock types.</td>
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<td></td>
<td>Fieldtrip. Visit to a field area in order to apply the theoretical and practical knowledge as well as to practice the different geological methodologies focuses on recovery geological information in the field to recognize materials, landforms and the geological history of the studied area.</td>
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<td></td>
<td>Report. To write a short scientific report based on the analysis of the data acquired during the fieldtrip, which should include the application of different geological methods applied in the laboratory, practices and seminars, and the theoretical concepts explained in the lectures.</td>
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<table>
<thead>
<tr>
<th>Materials</th>
<th>Basic and complimentary manuals. Lectures, seminars and practices must be accompanied, at least, by the reading of those technical manuals what include the most important concepts (see bibliography section of this Teaching Guide).</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Complimentary readings. Articles, books chapters, and other documents provided for the students to complete the topics explained in the lectures, seminars and practices, as well as the base for on-line activities (for example, discussions).</td>
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<tr>
<td></td>
<td>Problems and exercises. Documents with practical cases to be solved in order to learn and compliment the topics explained in lectures and seminars.</td>
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<td></td>
<td>Mineral and rock samples, topographic and geological maps, and aerial photographs. Samples of geological materials that must be identified by the students, and maps and aerial photographs which students must learn.</td>
</tr>
</tbody>
</table>

| Didactic resources | Virtual Campus web tool. Blackboard platform and institutional e-mails of lecturer and students used to interchange of documents, reports, exercises and information, among others. |
|                   | Videos, animations, documentary films, free books, etc. Resources to help to the students to understand the geological processes. |
|                   | Web Links. Web pages with additional information and resources of Geology, examples of Geology applied to the Environmental Sciences, news, Research Centers, etc. |
5. **ASSESSMENT: Procedures, evaluation and rate criteria**

The **assessment** of knowledge and generic and specific skills and competences acquired by students throughout the course will be a **continuous assessment**. For that reason, a **minimum attendance of 80% of all the classes** is required. Students who do not meet this minimum attendance will appear as “no show” in the ordinary examination session. This assessment applies to all registered students of the course, according to the rules governing the assessment processes of learning, approved by the Governing Council of 24 March 2011, except for those that have been granted explicitly the possibility of the occurrence in the form of final evaluation.

The **tools and methods** to conduct the assessment (which will account for 100% of the final grade of the course) will depend on participation in the activities of the subject, and the completion and delivery of work and theoretical and practical exercises, which break down as follows:

- Test exams at the end of each section (15%)
- Exercises and problems (10%)
- Practical exams (25%)
- Scientific report (10%)
- Final exam (40%)

The criteria for qualification will be a full knowledge (geological concept, theories, and models) as well as a command of the most basic geological techniques applied to the Environmental Sciences. Other criteria are: a successful application of this knowledge to problem solving, skills and competences, knowledge transfer, correct oral and written, and the ability to synthesize.

Students should remember that **copying and plagiarism** is strictly prohibited, whether in the report, exercises, or assessment tests. Students caught copying or plagiarizing will be failed, and other disciplinary actions will also be considered. Furthermore, proper citation of resources is necessary. On top of that, the Plots, graphics, diagrams, maps and topographic sections and geological sections should be presented in a clean with neatness and precision and is required in order for the examiners to assess the exercises, problems and exams.

To pass the subject in the ordinary examination session students whose attendance is less than previously mentioned, or that do not achieve a **minimum score of 5.0 in each assessed activity** will be failed in the ordinary examination session. To acquire the sum of the partial qualifications, students must have passed, independently, the final exam, the practical exam, the geological report as well as the other activities. If any of the parties not reach its average value, the student will be failed, even if the total sum of the scores for the various activities reaches a value of 5.0.

To overcome the **extraordinary examination session**, students must pass a theoretical exam (50% of the final mark) as well as a practical exam (50% of the final
which will be worth 100% of the final grade. This test will include theoretical and practical content of the whole subject (lectures, seminars, and practices).

6. RECOMMENDED READING

Core reading


Further reading


Tutorials about bibliography (in Spanish):

- AlfaBuah. How to search, select and evaluate the information to be used in an academic report. http://www2.uah.es/bibliotecafORMACION/BEco/AlfaBuah/index.html
• **Information sources.** To know the different type of documents helps to distinguish and to select the adequate information source for your report.  
  http://www2.uah.es/bibliotecaformacion/BPOL/ FUENTESDEINFORMACION/index.html

• **How to cite**  
  http://www.uah.es/biblioteca/ayuda_formacion/como_citar_inform.html

• **Style guide.** Resources and examples. Hands-on to develop your abilities to search for scientific information.  
  http://www2.uah.es/bibliotecaformacion/BMED/practica_tus_habilidades/index.html