ASIGNATURA / COURSE TITLE

MONITORIZACIÓN QUÍMICA / CHEMICAL MONITORING

1.1. Código / Course number

32765

1.2. Materia / Content area

This course is mandatory and is not included in any higher rank area within the master

1.3. Tipo / Course type

Compulsory - Mandatory

1.4. Nivel / Course level

Master

1.5. Curso / Year

1st

1.6. Semestre / Semester

FIRST SEMESTER (Fall)

1.7. Número de créditos / Credit allotment

4 ECTS

1.8. Requisitos previos / Prerequisites

Graduate level knowledge of chemistry, geology and mathematics

1.9. Requisitos mínimos de asistencia a las sesiones presenciales / Minimum attendance requirement

Attendance to practical sessions is mandatory and at least 80% of the theory classes.
1.10. Datos del profesor / Faculty data

González Yélamos, Javier
Departamento de Geología y Geoquímica
Facultad de Ciencias
Despacho: Modulo C-06, puerta 602
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Localidad: Madrid
Código Postal: 28049
Teléfono: 914975036
Fax: 914974900
e-mail: javier.yelamos@uam.es
Skype: javier.gonzalez.yelamos

1.11. Objetivos del curso / Course objectives

1. Content knowledge:

Natural chemistry of waters, with special attention to chemical monitoring.

The most common and most hazardous pollutants of inland waters and sources of their origin.

Water sampling and analysis techniques for pollutants and monitoring.

2. Skills and abilities:

To be able to test the validity of a chemical analysis.

To increase confidence in their ability to interpret the variation of data collected by a water quality station and to draw graphical representations of chemical data.
1.12. Contenidos del programa / Course contents

1. Basic aspects of water chemistry. Parameters and variables. Inorganic species and organic matter measurements

2. Natural chemical status of inland waters: rivers, lakes, groundwater. Acquisition of dissolved species in solution

3. Monitoring networks in the chemical quality of in Spain and European Directives: CEMAS, COCA, COAS, SAICA, fish life, OSPAR, exchange data UE, radiological, Eurowaternet, toxic and dangerous substances, nitrate network,

4. Water sampling, preservation and analysis procedures. Accuracy and precision in analysis


6. Diffuse or agricultural pollution. Nitrogen compounds and biocides.


1.13. Referencias de consulta / Course bibliography


Available on line at http://pubs.water.usgs.gov/twri9A.


Main web-pages

UNITED STATES GEOLOGICAL SURVEY http://www.usgs.org

ENVIRONMENTAL PROTECTION AGENCY Water topic http://www2.epa.gov/science-and-technology/water-science

The Hazardous Waste Clean-up Information http://www.clu-in.org/
Water Information System for Europe http://water.europa.eu/

2. Métodos docentes / Teaching methodology

Lectures and practical desk exercises (both in class and as homework) are the main teaching methodology.

It is mandatory to write a report about one of the priority pollutants included in the legislation of the EU.

Tutorials could be by face to face, by e-mail or by using Skype software.

There is a field work (3 hours) in order to visit the mobile unit of the CIEMAT; it is one of the most sophisticated mobile laboratories all over the world. If it cannot visit, it will go to visit a river automatic monitoring station in the surroundings of the UAM or a laboratory.

The subject is complemented with other activities in the subject titled Integrated Monitoring, as sampling different bodies of water and chemical analysis of water samples in laboratory.
3. Tiempo de trabajo del estudiante / Student workload

<table>
<thead>
<tr>
<th>Tasks</th>
<th>hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>lecture attendance: (face to face class)</td>
<td>22</td>
</tr>
<tr>
<td>Practical sessions (face to face class)</td>
<td>10</td>
</tr>
<tr>
<td>Homework exercises</td>
<td>15</td>
</tr>
<tr>
<td>Written report</td>
<td>20</td>
</tr>
<tr>
<td>Exam preparation:</td>
<td>29</td>
</tr>
<tr>
<td>Practical field trip</td>
<td>3</td>
</tr>
<tr>
<td>Examination: (face to face exam)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total amount of work</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

4. Métodos de evaluación y porcentaje en la calificación final / Evaluation procedures and weight of components in the final grade

1) Theory exam: test type multiple-choice items and short answers.

2) Practical final exam, which covers practical exercises done during the course.

3) Individually written report about the hydrological characteristics of a specific body of water.

4) Corrected at home work exercises.

Distribution of the final grade among the different activities and in relation to the amount of work the student has to do for the course, expressed in percentages
Theory exam: 35%
Practical test: 35%
Written report about one priority pollutant: 20%
At home work exercises: 10%

Maximum score, 10 points, expressed with one decimal.

Any student that participated less than 10% of evaluable activities will be qualified as “unevaluated”.

In the case that the student does not obtain the minimum requirements for passing the course (see evaluation section) will have another opportunity “convocatoria extraordinaria” at the end of the academic year.

5. Cronograma* / Course calendar at UAM

<table>
<thead>
<tr>
<th>Month</th>
<th>Lectures</th>
<th>Practical session</th>
<th>Field trip</th>
<th>Final exam:</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>6 hours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October</td>
<td>4 hours</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>November</td>
<td>6 hours</td>
<td>6 hours</td>
<td></td>
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</tr>
<tr>
<td>December</td>
<td>6 hours</td>
<td>3 hours</td>
<td>4 hours</td>
<td></td>
</tr>
</tbody>
</table>

*It is a tentative schedule course, for a more detail one, please checks the final calendar.