## IDENTIFYING DATA

### Meteorology

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| Subject | Meteorology |
| Code | O07G410V01905 |
| Study programme | Grado en Ingeniería Aeroespacial |

| Descriptors | ECTS Credits | Choose | Year | Quadmester |
|---|---|---|---|---|
| | 6 | Optional | 4th | 2nd |

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| Teaching language | #EnglishFriendly Spanish Galician |
| Department | |
| Coordinator | de la Torre Ramos, Laura |
| Lecturers | de la Torre Ramos, Laura Nieto Muñiz, Raquel Olalla |
| E-mail | ltr@uvigo.es |
| Web | http://aero.uvigo.es |
| General description | Introduction to meteorology, the measurement of parameters, the instrumentation and its influence on the flight. English Friendly subject: International students may request from the teachers: a) materials and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English. |

## Skills

| Code | |
|---|---|
| A2 | That the students know how to apply their knowledge to their work or vocation in a professional way and that they possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study |
| A3 | That the students have the capability to gather and interpret relevant data (usually within their area of study) to issue judgments that include a reflection on relevant social, scientific or ethical issues |
| A5 | That the students develop those learning capabilities necessary to undertake further studies with a high degree of autonomy. |
| C10 | Understand how the aerodynamic forces determine the dynamics of the flight and the role of the different variables therein. |
| D11 | Show motivation for quality with sensitivity towards subjects within the scope of the studies |

## Learning outcomes

| Expected results from this subject | Training and Learning Results | | |
|---|---|---|---|
| Knowledge of the meteorological effects and its causes | A2 A3 A5 | | D11 |
| Understanding of the usage and impact of meteorology on aircraft operations. | A2 A3 A5 | C10 | D11 |
| Understanding of the theoretical foundations of meteorological systems and instrumentation | A2 A3 A5 | | D11 |

## Contents

| Topic | |
|---|---|
| Atmosphere and meteorology | The atmosphere Composition and structure Meteors |

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|---|---|
| Instrumentation and meteorological information | Meteorological observations in airfields<br>Meteorological observations from aircraft<br>The meteorological radar<br>Satellites<br>Aeronautical meteorological Information |
| Thermodynamics | Sounding data<br>Isobaric and adiabatic condensation<br>Aerological diagrams<br>Temperature and humidity parameters and stability levels<br>Stability assessment<br>Effects on the flight |
| Wind | Introduction<br>Equation of movement<br>Horizontal flow<br>Isobaric coordinates<br>Thermal wind<br>Wind structure in the PBL<br>Effects on the flight |
| Clouds microphysics | Aerosols<br>Previous concepts<br>Warm clouds<br>Cold clouds<br>Effects on the flight |
| Convection | Previous concepts<br>Convective storms<br>Dynamics of supercells<br>Electricity<br>Downburst<br>Mesoscale convective systems (MCS)<br>Effects on the flight |
| Visibility | Introduction<br>Factors affecting visibility<br>Fogs and strata<br>Duststorms<br>Effects on the flight |
| Depressions | Introduction<br>Tropical cyclones<br>Extratropical cyclones<br>Thermal lows<br>Effects on the flight |
| Meteorological prediction | Prediction<br>Numerical weather prediction |
| Meteorology and space operations | Fundamental characteristics<br>Launching conditions<br>Reentry conditions<br>Influence in orbit |

## Planning

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 24 | 15 | 39 |
| Autonomous problem solving | 15 | 20 | 35 |
| Practices through ICT | 10 | 0 | 10 |
| Presentation | 1 | 5 | 6 |
| Objective questions exam | 2.5 | 30.5 | 33 |
| Essay | 0 | 27 | 27 |

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

## Methodologies

| | Description |
|---|---|
| Lecturing | Theoretical classes in the classroom for all the group.<br>The students will have to complete assignments that will help to fix or expand their knowledge. |
| Autonomous problem solving | Student will be asked to perform tasks or exercises autonomously. Part of these exercises will have to be completed out of the classroom.<br>The professor will supervise the tasks |

| Practices through ICT | Seminars using computers. Personalized follow-up of the student during the class. Students will be asked to solve different exercises. |
|---|---|
| Presentation | Presentation in class to demonstrate what was learned during the completion of the essay oriented to teaching classmates |

## Personalized assistance

| Methodologies | Description |
|---|---|
| Lecturing | Assistance during class and tutorials |
| Practices through ICT | Assistance during class and tutorials |
| Autonomous problem solving | Assistance during class and tutorials |
| Presentation | Assistance during class and tutorials |

| Tests | Description |
|---|---|
| Essay | Assistance during class and tutorials |

## Assessment

| | Description | Qualification | Training and Learning Results | | |
|---|---|---|---|---|---|
| Autonomous problem solving | Evaluation of the student's involvement in classes. Evaluation of the student's performance in the proposed tasks or problem resolution. | 20 | A2 A3 A5 | C10 | D11 |
| Practices through ICT | Evaluation of the student's involvement in classes | 5 | A2 A3 A5 | C10 | D11 |
| Presentation | Students will have to make a presentation on a topic prepared outside of class hours, aimed at helping their classmates learn how meteorology can affect aeronautical or space operations. | 10 | A2 | | D11 |
| Objective questions exam | Answering of short answers questions. | 55 | A2 A3 A5 | C10 | D11 |
| Essay | Students will have to do an essay focused on how meteorology can affect aeronautic or space operations | 10 | A2 A3 A5 | | D11 |

## Other comments on the Evaluation

**Continuous assessment:**

To pass the subject through continuous assessment, it will be compulsory to attend at least 21 hours out of the 25 face-to-face sessions corresponding to the practices in computer rooms (seminars) and deliver all the tasks proposed to be done outside the classroom (both for the theoretical and the practical part).

It will also be mandatory: i) to take the written test, ii) to make the presentation

In addition, the student will have to achieve at least half of the total grade in each of the assignments that are graded.

**In the event that a student cannot apply to continuous evaluation (for justified reasons)**:

The oral presentation and the delivery of the exercises proposed in seminars are compulsory, in addition to taking the written test. In addition, the student will have to achieve at least half of the total grade in each of one.

In this case the qualification percentages will be:

20% exercises proposed in seminars (minimum grade required to pass: 1 out of 2)

10% Presentation (minimum grade required to pass: 0,5 out of 1)

70% Written test  (minimum grade required to pass: 3,5 out of 7)

**Second opportunity**:

100% exam (minimum grade required to pass: 5 out of 10)

In case of not attending the test, or not passing it, the student will be evaluated in the same way as the rest of the students for the following calls.

**End of degree call**

The student who chooses to take the exam at the end of the degree will be evaluated only with the exam (which will be worth 100% of the grade). In case of not attending this exam, or not passing it, it will be evaluated in the same way as the rest of the students for the following calls.

**Exam dates:**

The exam dates are published on the website http://aero.uvigo.es/gl/docencia/exames

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| Sources of information |
|---|
| **Basic Bibliography** |
| J. V. Iribarne, W. L. Godson, **Termodinámica de la atmósfera**, Ministerio de Medioambiente, 1996 |
| Wallace, J.M. Y Hobbs, P, **Atmospheric Science**, Elsevier, 2006 |
| **http://www.aemet.es/es/portada**, |
| **www.meted.ucar.edu/index.php**, |
| González López, Blanca, **Meteorología aeronáutica**, 978-84-935506-7-7, 3, 2014 |
| **Complementary Bibliography** |
| Bohren, C. y Albrecht, B., **Atmospheric Thermodynamics**, Oxford University Press, 1998 |
| Houze, R.A, **Cloud Dynamics**, Academic Press, 1993 |
| **www.zamg.ac.at/docu/Manual/SatManu/main.htm**, |

| Recommendations |
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