Universidad de Alcalá

MASTER'S DEGREE IN SCIENCE AND TECHNOLOGY FROM SPACE

GENERAL COMPETENCES:

- Possess sufficient knowledge to start or improve their professional work in the field of industry and research from space.
- Basic knowledge of the structure of the universe.

SPECIFIC COMPETENCES:

- Ability to know the instrumentation on board satellites for the measurement of X-rays, gamma and cosmic rays.
- Mastery of the most recent advances in the study of X-ray, gamma-ray and cosmic ray astronomy.
- Basic knowledge of star structure and ability to understand the fundamentals of astrophysics
- Mastery of galactic structure and extensive knowledge of cosmology
- Mastery of the characteristics of the different regions of the Earth's magnetosphere, both from the point of view of fields and particle populations
- Broad knowledge of the concept of geomagnetic storm, both from the point of view of the physical phenomena that it implies and the changes that it produces in the terrestrial environment, as well as its morphology based on different geomagnetic indexes.
- Ability to analyse the potential damage that geomagnetic storms can cause to different technological systems, both land-based and satellite-based.
- Knowledge of the current tools for predicting geomagnetic activity.
- Knowledge of the general characteristics of the behaviour of a plasma, as well as the relevant parameters and main models that describe them.
- Extensive knowledge of the main physical processes that take place on the sun during violent and explosive phenomena, their propagation through the interplanetary medium and their effect on the earth's magnetosphere.
- Knowledge of the different bodies that make up the Solar System
- Understand the existing missions and techniques for the exploration of the Solar System
- Understand the most important concepts and models regarding the origin and evolution of the Solar System
- Ability to evaluate scientific discoveries in this field, their impact on society and the needs for further planetary exploration
- Acquire advanced training, of a specialized and multidisciplinary nature, aimed at promoting initiation in research tasks in Artificial Intelligence.
- Deepen knowledge of Artificial Intelligence techniques and methods in order to be able to tackle and solve scientific and technological problems through research.
- To train the student to be creative in tackling and solving scientific and technological problems through research in Artificial Intelligence in space environments.
- Recognize the need for and usefulness of real-time systems in space environments

- Identify the temporal requirements that a control system must meet.
- Distinguish between hard and soft real-time systems and understand the planning techniques for these systems.
- Understand the problems associated with the priority inversion, identify them and provide the most appropriate solution in each case.
- Understand and know how to use software development environments and ability to apply the programming standards for this type of system.
- Know how to use the API of a real time system and understand how it works.

For additional information, see the Memorandum.