# History of Science

## Prof. Franco Giudice

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

The course aims to furnish students with knowledge about the origins of modern science, in particular, the period between Galileo and Newton. Students are expected to develop awareness of the various conceptions of science in relation to contemporary lifestyles, in such a way that they can provide “educational consultancy” on the ethical and political challenges that science and technology pose in contemporary societies.

The aim of the course is to offer students a thorough knowledge of the main developments contributing to the birth of modern science between Galileo and Newton. The specific objectives of the course are as follows:

1. to present an overview of the spread of Copernicanism in the modern age and, in particular, within the work of Galileo and Newton.
2. to compare the concepts - time, force and movement - that have guided the developments of modern science and Newton’s synthesis of these in his new world system.
3. to evaluate, analytically and critically, the meaning of the Newtonian synthesis in the light of 20th-century revolutions in the fields of physics and cosmology.

By the end of the course, students will:

1. have thorough knowledge of the modern cosmological theories in general and, more specifically, those of Galileo and Newton;
2. have acquired and developed the ability to use the philosophical and scientific lexicon and conceptual devices learned through analysing the texts in the historical and scientific context examined on the course, and apply the same skills to other historical and scientific contexts;
3. be able to communicate and explain scientific theories related to the topics covered, taking into account the conceptual devices and lexical tools acquired on the course.

***COURSE CONTENT***

The course is divided in two stand-alone modules.

Module 1 will focus on the history of Galileo's telescope, from the publication of *Sidereus nuncius* (13 March 1610) to the dissemination of Galileo’s discoveries throughout Europe. There will be a particular focus on Galileo’s understanding of the relationship between science and religion.

Module 2 will focus on the birth of Isaac Newton's new world system, analysing the most significant parts of *The Mathematical Principles of Natural Philosophy* (1687) as well as Newton's correspondence with the theologian Richard Bentley, in which the scientist attributes the origin and order of the universe to the intelligent design of God for the first time.

***READING LIST***

Module 1:

G. Galilei, *Sidereus nuncius*, edited by A. Battistini, Venice, Marsilio, 1993 (or successive editions).

M. Bucciantini-M. Camerota-F. Giudice, *Il telescopio di Galileo. Una storia europea*, Turin, Einaudi, 2012.

M. Camerota-F. Giudice-S. Ricciardo, *Galileo ritrovato. La lettera a Benedetto Castelli del 21 dicembre 1613*, Brescia, Morcelliana, 2019.

Module 2:

I. Newton, *Principi matematici della filosofia naturale*, edited by F. Giudice, Turin, Einaudi, 2018.

R. Iliffe, *Newton. Il sacerdote della natura*, Milan, Hoepli, 2019.

***TEACHING METHOD***

The course will be delivered by means of frontal lectures and involve active student participation, both in terms of discussion and in the possibility of producing papers to present and discuss during the course.

***ASSESSMENT METHOD AND CRITERIA***

Students will be assessed by means of an oral exam designed to verify, with regard to course content, the following: 1) that students have read and analysed the texts on the reading list in full; 2) students’ ability to present the texts' contents and arguments accurately and precisely; 3) students’ skill in arguing an issue and clearly expressing even the most challenging and complicated concepts; 4) students' use of suitable language style and technical vocabulary.

***NOTES AND PREREQUISITES***

There are no prerequisites for this course.

In the event that the health emergency should continue, both teaching activities and any forms of learning monitoring, both in progress and final, will be provided also remotely through our University's BlackBoard platform, the Microsoft Teams platform and any other tools envisaged and notified at the beginning of the course, so as to ensure the full achievement of the formative objectives set out in the study plans and, at the same time, the safety of our students.

Further information can be found on the lecturer's webpage at http://docenti.unicatt.it/web/searchByName.do?language=ENG or on the Faculty notice board.