



# UNIVERSITÀ DI PISA

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## STORIA CONCETTUALE DELLA FISICA

**STEVEN NEIL SHORE**

Anno accademico 2023/24  
CdS FISICA  
Codice 342BB  
CFU 6

Moduli	Settore/i	Tipo	Ore	Docente/i
STORIA CONCETTUALE DELLA FISICA	FIS/08	LEZIONI	48	STEVEN NEIL SHORE

### Obiettivi di apprendimento

#### *Conoscenze*

Examination of the development of physical theories and methods from classical and mediaeval times through mid-20th century. The details will change each year based on the students' interests and experience. The parallel developments in Western (i.e., greco-latin) and non-Western cultures (e.g., China, India, Islam) will also enter. Topics include:  
elementary principles of realism, space, time, displacement and change  
development of kinematic and dynamical methods and the early use of geometrical and algebraic mathematical methods  
concept of natural laws and regularities  
use of symmetries and conservation principles from Aristotle through contemporary physics  
the concept of field and active space  
the role of the "paranormal" (i.e. magical thinking and methods) in the early modern period

#### *Modalità di verifica delle conoscenze*

a paper based on original sources (not merely a summary ala Wikipedia), selected on consultation, examining the development of some physical concept or examining a historical development or period.

#### *Prerequisiti (conoscenze iniziali)*

lingua inglese, fisica 1,2, matematica (analisi)  
geometria sarebbe utile

#### *Indicazioni metodologiche*

Lectures in English with bilingual discussions

#### *Programma (contenuti dell'insegnamento)*

Basic concepts of space, time, dynamics, force (from classical to 17th century)  
Introduction of empirical methods to study natural phenomena  
Application of mathematical reasoning to physical problems (14-19 century)  
Extension to action-at-a-distance, fields (17 - 20 century)

#### *Modalità d'esame*

A review, written essay based on original literature, following a physical concept and its development.

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