UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

History of Science

2122-2-E2004P010

Learning area

3: Study of socio-economic and cultural aspects related to communication processes.

Learning objectives

Knowledge and understanding:

- Main concepts and themes on the history of western scientific thought
- Intellectual, social, and economic factors characterizing the development of scientific knowledge
- Epistemological, social, and cultural implications of different scientific theories and traditions

Applying knowledge and understanding:

- Improvement of the student's cultural background, increasing his critical attitude and awareness of scientific investigation as a tool for the management and solution of collective issues
- Acquaintance with different forms and practices of science and scientific communication, in an interdisciplinary perspective
- Development of design capacity, organization and coordination of cultural activities and projects concerning the history of scientific disciplines
- Development of analysis and interpretation skills of texts, images, and symbols

Contents

Title > **An interdisciplinary history of space**

The course is divided into two parts.

a) After some preliminary considerations on the concept of "science" and on the main models of interpretation of its development, the **first institutional part** will examine some fundamental moments of the history of Western scientific thought from antiquity to the 20th century. In this context, particular attention will be paid to the origins and developments of experimental psychology between the 19th and 20th centuries as an interdisciplinary synthesis among philosophy, physics, biology and neurophysiology.

b) In the **second monographic part**, some particular conceptions of space and spatiality will be examined from a historical and interdisciplinary perspective: from geometry to physics, from philosophy to psychology and psychopathology.

Detailed program

a) General part – *Fundamentals of history of scientific thought*

- Preliminary considerations of history and philosophy of science.
- The birth of Greek science.
- Hippocrates and the medical school of Cos.
- The great metaphysical systems (Plato and Aristotle).
- The scientific culture of the Hellenistic age: medicine, mathematics and astronomy.
- The brief renaissance of the imperial age: Ptolemy and Galen.
- The decline of science in the late antique and medieval Western world.
- The Renaissance "revolution".
- Leonardo da Vinci and the world of techniques.
- The birth of modern science: the renewal of astronomy and medicine.
- Galileo Galilei and experimental method.
- Descartes and mechanism.
- The discovery of blood circulation and iatromechanism.
- Isaac Newton.
- Lavoisier and the birth of modern chemistry.
- The foundation of the man sciences: empiricism and associationism; the French ideologists and mechanistic reductionism.
- Biology, physiology, and early scientific approaches to mental processes in the 19th century: psychophysics; phrenology; the study of reaction times; physiology.
- Charles Darwin and the theory of evolution.
- The birth of scientific psychology: Wundt and the Leipzig laboratory; structuralism; functionalism; Gestalt psychology; objective psychologies (reflexology and behaviorism).

b) Monographic part – *An interdisciplinary history of space*

- Preliminary considerations on the concept of space.
- Space in Euclidean and non-Euclidean geometry.
- The concept of space in ancient (Aristotle), classical (Newton) and modern (Einstein) physics.
- Space, perception and environment from the perspective of the Gestalt-Psychology: life space (Lewin) and spatial depth in stereokinetic phenomena (Musatti).

- Space and mental illness: the concept of "thymic space" in Ludwig Binswanger's work.

Prerequisites

None.

Teaching methods

Teaching methods consist in direct exposure, group discussion, analysis of historically and scientifically significant texts, the development of experiences and/or exercises, and in-depth studies of a seminar nature. ***Class attendance is strongly recommended****.*

Lessons will be held in presence, unless further COVID-19-related restrictions are imposed.

Assessment methods

The verification of learning will be carried out through a written test, divided into a part with multiple-choice questions and a part with open questions. The questions are aimed at testing the effective acquisition of the topics illustrated during the course, as well as to ascertain the ability to manage the contents of the proposed bibliography and the capability to critically deal with them.

Upon student's request, the exam can be integrated by an oral examination, on all the course topics.

Textbooks and Reading Materials

a) *Parte generale:*

- Hall, A.R., & Boas Hall, M. (2022 [1964]). *Breve storia della scienza*, a cura di A. Molaro. Milano: Pgreco (pp. 13-181, 208-230, 247-262, 343-359) ***
- Morabito, C. (2007). *Introduzione alla storia della psicologia*. Roma-Bari: Laterza (pp. 21-51, 55-85, 115-159)

b) *Parte monografica:*

- Jammer, M. (1966 [1954]). *Storia del concetto di spazio*. Milano: Feltrinelli (pp. 19-34, 86-109) [available in pdf format]
- Kline, M. (1976 [1953]). *La matematica nella cultura occidentale*. Milano: Feltrinelli (pp. 48-65, 378-416) [available in pdf format]
- Newton, I. (1965 [1687-1726]). *Princìpi matematici della filosofia naturale*, a cura di A. Pala. Torino: UTET (pp.

55-58, 91-111) [available in pdf format]
- Einstein, A. (1988 [1950]). La relatività e il problema dello spazio. In A. Einstein, *Opere scelte*, a cura di E. Bellone (pp. 486-504). Torino: Bollati Boringhieri [available in pdf format]
- Lewin, K. (1970 [1936]). *Princìpi di psicologia topologica*, a cura di A. Ossicini. Firenze: OS (pp. 8-14, 45-62, 70-79) [available in pdf format]
- Musatti, C.L. (1976 [1975]). I fenomeni stereocinetici e la loro interpretazione. In C.L. Musatti, *Riflessioni sul pensiero psicoanalitico e incursioni nel mondo delle immagini* (pp. 240-261). Torino: Boringhieri [available in pdf format]
- Binswanger, L. (2022 [1933]). *Il problema dello spazio in psicopatologia*, a cura di A. Molaro. Macerata: Quodlibet (pp. 13-90, 99-103, 125-155 con le relative note) ***

*** Available from march 2022

NB. Additional supplementary materials will be made available by the teacher on the e-learning platform at the end of the course. These supplementary materials are an integral part of the exam program. International students are asked to contact the teacher.