

PhD course in Physics, Astrophysics, and Applied Physics - Università degli Studi di Milano
PhD cycle 40 (2024-2025)

All lectures will be given in English.

Course title	Advanced topics in astrophysics and plasma physics-Fundamentals of cosmic structure formation
Teacher in charge of the course	Luigi Guzzo
List of the teachers of the course <i>[surname/name; affiliation; e-mail]</i>	Guzzo Luigi, UniMI, luigi.guzzo@unimi.it
Training objectives	Provide the student with an overview of the state of the art in the observations of large-scale structure with galaxy surveys, as one of the pillars of the standard model of cosmology; introduce the theoretical framework for the statistical description of galaxy clustering and the formation of cosmic structure; discuss how to extract estimates of cosmological parameters from observations, evidencing both observational and modelling systematic errors that may affect these results.
Prerequisites <i>[please insert details and also state whether the course has advanced contents suitable for students with prior knowledge of the topics or is also suitable for students without prior knowledge]</i>	Basic knowledge in astrophysics and Big Bang cosmology is requested. The course is meant to provide the student with the tools to understand modern observations of large-scale structure and their cosmological analysis.
Detailed course program	<ul style="list-style-type: none">• Overview of current observations of large-scale structure• Statistical description and theory of structure formation• Deriving cosmological parameters from LSS observations: nonlinear evolution, galaxy bias and redshift-space distortions• Stage IV cosmological surveys: DESI, Euclid and future measurements
Examination modalities	Seminar to members of the cosmology group on a selected topic, to be agreed with the teacher
Preliminary schedule <i>[please indicate the weeks when the lectures will be given]</i>	The course is typically concentrated within 1 week during the month of February.