compulsory courses

**Gravitational Physics** *(Prof. A. Rocchi)*  
*Compulsory, 6 ECTS*

**Relativity and Cosmology 2** *(Prof. N. Vittorio)*  
*Compulsory, 6 ECTS*
optional courses

**Astrobiology** *(Prof. A. Balbi, Prof. D. Billi)*
*Optional, 6 ECTS*

**Gravitational Lensing** *(Prof. P. Mazzotta)*
*Optional, 6 ECTS*

**Gravitational Waves** *(Prof. V. Fafone)*
*Optional, 6 ECTS*

**High Energy Astrophysics** *(Prof. G. Tavani – Prof. G. Israel)*
Introduction: history of X-ray and Gamma-ray astronomy; collimated vs. imaging instruments, angular, spectral and time resolution. Basics: emission mechanisms; degenerate stars (white dwarfs and neutron stars); black holes; accretion theory. Compact X-ray and Gamma ray sources: radio pulsars, X-ray binaries, isolated compact objects, magnetars. Brief introduction to high energy
emission from non-degenerate stars, supernova remnants and galaxies of the local group. Gamma ray bursts.  
Optional, 6 ECTS

**Radiative Processes in Astrophysics (Prof. P. Mazzotta)**
Optional, 6 ECTS

**Extragalactic Astrophysics (Prof. F. Vagnetti)**

Compulsory, 6 ECTS

**Italian as a foreign language**

Optional, 3 ECTS