



<b>Course Title :</b>	<b>Advanced Cosmology</b>
<b>Number of hours/semester :</b>	30 h, 2 <sup>nd</sup> Semester
<b>Number of ECTS :</b>	3
<b>Lecture outline, contents :</b>	The advanced cosmology lectures treat cosmological perturbations, their evolution in the primordial Universe and up to the formation of large scale structure. The lectures start from the description of perturbations of the metric and its decomposition into scalar, vector and tensor modes. The evolution and conservation equations of the baryon, radiation and dark matter fluids perturbations are established in the framework of general relativity. The evolution of the baryon/photon and the dark matter perturbations are studied in detail. The physics of Cosmic Microwave Background anisotropies, the dependence of the power spectrum on cosmological parameters, the polarization and the impact of tensor modes are described. An introduction to non-linear evolution of matter perturbation and structure formation is provided. The last lecture gives a panorama of different probes of the early Universe perturbations: lensing, BAOs etc...
<b>Pedagogical methods :</b>	Lectures
<b>Prerequisites :</b>	Cosmology 1 <sup>st</sup> Semester
<b>Modalities of knowledge assessment :</b>	Written examination at the end of the semester for the first session and Oral examination for second session (for the second session, the maximum grade is limited to 10)
<b>Bibliography :</b>	<ol style="list-style-type: none"> <li>1. Modern Cosmology, S. Dodelson. Academic Press (Elsevier), 2003.</li> <li>2. Galaxy Formation and Evolution, H. Mo, F. van den Bosch, S. White, Cambridge, 2011.</li> <li>3. Cosmological Physics, J. A. Peacock. Cambridge University Press, 1998.</li> </ol>