

## **The Course Outline: Cosmology 2, Winter 1391 (Winter 2013)**

Cosmology is the science of the universe as a whole. A study of cosmology brings smallest scales, relevant to quantum mechanics and particle physics, in contact with the largest scales, scales as big as the size of the universe. Many progresses on the theoretical sides as well as numerous ground-based and space-based observations during past two decades made cosmology a very active area of research. In some senses, we are in the golden age of cosmology.

This course is devoted to theoretical cosmology at the PhD level. This is a continuation of cosmology 1 from the previous semester. In cosmology 1 we have reviewed standard cosmology focusing on dynamics of FRW cosmology, extensive studies of thermal history of universe with connections to observations and inflation at the background level. These were covered until chapter 4 of Weinberg cosmology book “**Cosmology**”, Oxford University Press, 2008.

During the course Cosmology 2, we mainly concentrate on cosmological perturbation theory, studies of CMB anisotropies and inflation with perturbations. We will systematically cover chapters 5, 6, 7 and 10 of Weinberg cosmology book.

We will closely follow Weinberg. But students who are looking for alternative textbooks may find the book by Dodelson: “**Modern Cosmology**” helpful specially in dealing with CMB physics. Those who are interested in cosmological perturbation theory and its applications to inflation may also find the book by Mukhanov: “**Physical Foundations of Cosmology**” useful.

This is a technical course so the students are expected to know GR and the basics of QFT.

**Time and place of the course:** Monday 2pm - 5:30pm, IPM, School of Astronomy, Larak garden. There will be a 1/2 hour break during the class.

The first session is Monday, Bahman 23, 2 pm.

### **My Contact information**

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