

Mongolian Young Scholars Program 2016
Making Sense of the Universe
Course Syllabus

Seminar leader:

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About this course:

This course is designed to introduce students with basic concepts and ideas in astronomy. In this class we will learn about the current understanding of the Universe, explore the scale of the Universe and our place in it, and study the formation of our Solar System. We will mostly focus on the big picture.

Why study astronomy?

Most people are excited to talk about planets, stars, black holes, and discuss mysteries of the universe. Introduction to astronomy is very engaging and attracts young people to the sciences. Most universities offer astronomy classes to students. Moreover, unlike other sciences, astronomy can become a hobby. By studying astronomy, students will understand ideas that changed our view of the universe. This course is designed to give students general information about astronomy and inspire them to study more.

By the end of the course:

- Students will learn about basic facts and theories of astronomical universe.
- Students will get the general idea of the formation of the solar system.
- Student will gain knowledge of the history of astronomy.
- Students will improve their reading, thinking, and speaking skills.

Simple rules:

- Active participation and preparedness is expected at all times.
- You must always do your homework. Homework assignments must be completed on the scheduled due date.
- All students must accept responsibility for themselves and their actions
- Classroom discussion is a big part of learning.
- The lectures will be supplemented with movie suggestions, videos, and additional materials to make the course as interesting as possible.

You need to have the following in class each day:

- Reading materials
- Notebook for taking notes in class
- Pens or pencils

Homework:

Students will have one page writing assignments each day. Students will write about what they have learned in class and their learning experiences. Further writing assignment instruction will be given in class. We will read the essays out loud in class and use them in our discussion. These assignments will also help us with the reviewing of previous materials.

Course prerequisites:

None. This is a non-technical course. No calculus or geometry is required.

Course schedule:

Day 1
Introduction
Our Place in the Universe

What we will study	Learning goals
Our modern view of the Universe	What is our place in the Universe? How did we come to be? How can we know what the Universe was like in the past? Can we see the entire universe?

Day 2
Our place in the Universe

What we will study	Learning goals
The Scale of the Universe	How big is Earth compared to our solar system? How far away are the stars? How big is the Milky Way galaxy? How big is the Universe?

	How do our lifetimes compare to the age of the Universe?
Spaceship Earth	How is Earth moving in our solar system? How is our solar system moving in the Milky Way galaxy? How do galaxies move within the Universe? Are we ever sitting still?

Day 3
Astronomy in our everyday life

What we will study	Learning goals
The Reason for Seasons	What causes the seasons?
The Moon Our Constant Companion	Why do we see phases of the Moon?

Day 4
Formation of Planetary Systems

What we will study	Learning goals
A brief tour of the Solar System	What does the Solar System look like
Clues to the Formation of our Solar System	What features of our solar system provide clues to how it formed? What theory best explains the features of our solar system?
The Birth of the Solar System	Where did the solar system come from? What caused the orderly patterns of motion in our solar system?

Day 5
Formation of Planetary Systems

What we will study	Learning goals
The Formation of Planets	Why are there two major types of planet?

Where did asteroids and comets come from?

How do we explain the existence of our Moon and other exceptions to the rules?

