How to get prepared for the midterm

1 It will take some time to do this. You cannot do it overnight - there is too much material to learn.

2 Read lecture notes. If you find that you are not comfortable with what is discussed or mentioned in the notes, read the textbook. Appropriate pages in the textbook are indicated in your syllabus.

3 The midterm is like a big quiz. There will be about 20-30 questions of the same type as you had in quizzes. So, try to redo the quizzes. Look up the lecture notes and the textbook, if you are not certain about some of your answers.

4 Here is a list of topics, which may help you to get prepared:

- Learn how to write and understand large and small numbers (power of 10 notations).
- Learn units of time, mass, and distance: km, m, AU, pc, kpc, Mpc, g, kg, solar mass
- Know *relative* size and scales of different astronomical objects. Which planet is bigger, which is smaller, which is closer, which is further, which planet moves faster, which slower? Which planet is dense, which is less dense?
- Know gross differences in atmospheric composition of planets.
- Know basic features on the surfaces of planets: types of volcanoes and volcanic activities, impact craters, mountains, river-beds, and so on. Look at pictures of planets and moons. Try to recognize different features.
- Asteroids: sizes, composition, where in the solar system they are (preferentially) found.
- Comets: sizes of different components, composition, direction of tails relative to the Sun. Learn about the Oort cloud and the Kuper belt.
- Learn what is convection and its manifestations in the solar system.
- Learn major features of our Sun: granulation, sun spots, magnetic field, prominences, flares.
- Learn what kind of contribution different astronomers made to the development of science. Names, which you should especially pay attention to: Aristotle, Ptolemy, Copernicus, Brahe, Kepler, Galileo, Newton.
- Learn why ancient Greeks placed our Earth at the center of the Universe. Learn what is the geocentric system, parallax, retrograde motion, epicycles, and differents.
- Know basic features of the heliocentric system. Know how Copernicus explained the parallaxes of stars and the retrograde motion of planets. You should be able to draw a simple diagram to illustrate your answers.
- Know how to explain seasons, phases of the Moon, and eclipses.

- Know the three Kepler's laws. Do not bother to memorize which law is the first, which is the third. Do not give answers like "the first law is the law of ellipses". Explain the laws, draw simple diagrams, which would indicate that you know the laws.
- Know the Newton's laws of motion and some of their applications to the motion of astronomical objects.
- Know the Newton's law of gravity: how the force depends on the distances between centers of objects and on their masses.
- Learn how the laws are applied to different objects. Know what is the escape velocity, how the "weightlessness" is explained. Know how binary stars move and how astronomers find their masses.
- Know gross details of our Galaxy: sizes, rotational velocity, position of our Sun, major components.
- Know different types of galaxies. Be ready to recognize type of a galaxy when you see it.
- Know what is the rotation curve of spiral galaxies and why it indicates the presence of the dark matter.