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**SCIE 104 EXPLORING THE UNIVERSE  
FALL 2018**

**Class Meeting Location:** TBA

**Class Meeting Times:** TBA

**Instructor:** Fethi M Ramazanoğlu

**Office Hours:** TBA

**Office Location:** SCI215

**Email:** [framazanoglu@ku.edu.tr](mailto:framazanoglu@ku.edu.tr)

**Number of KU credits:** 4 **ECTS credits**: 8

**Language:** English

**Course description**

This is a course about understanding our solar system, other stars, galaxies, and ultimately the entire universe in terms of modern astronomy and astrophysics. The emphasis will be on qualitative understanding rather than mathematics, we will nevertheless use some equations. Aside from theoretical knowledge, we will also learn the basics of using a telescope, and how to identify objects in the night sky. Note that laboratory sessions are a mandatory part of this class.

The emphasis of the course will be in understanding the causal relationship between basic physical laws and the phenomena around us, showing how various seemingly unrelated events from weather on Earth to galaxy structures can all be explained by the same fundamental principles. We will see how scientific inquiry has led us to an understanding of the universe as a whole, and our position in it as human beings.

**Course Materials:  
Mandatory Textbook:** *Discovering the Essential Universe, Edition: 3 (ISBN: 978-1429255196)*.

We will very closely follow the textbook. Later additions are more up to date in terms of scientific knowledge, so you may want to buy them for future use, and they also cover all the topics of the course. However, they are more expensive. The latest is the 6th edition

**Additional:** I will post lecture slides and sample exams from past years on Blackboard as weeks pass. However, note that these are not substitutes for the actual lecture experience, please attend all the lectures to make the best use of the course.

**Learning Objectives**Upon successful completion of this course, you will be able to:

1. follow popular science discussions about the past and future of our planet, the solar system and the entire universe
2. have an informed opinion about the position of human beings and the Earth in the Universe.
3. use a telescope for basic observations and identify the well-known objects in the night sky
4. understand the elements of the Solar System and their relationships
5. distinguish the Sun from other stars in its life story and current stage
6. understand the qualitative effects of gravity and its central role in the universe.

**Assessment methods & grading scheme:**

|  |  |
| --- | --- |
| **Type** | **Final Grade %** |
| 2 Midterms | 46 |
| Final Exam | 29 |
| Lab | 21 |
| Attendance to one telescope session | 4 |
| **Total** | **100** |
|  |  |
| Telescope session **bonus** (2% per session) | 6 |
| Quiz **bonus** (2% per quiz) | 8 |

Koç University grading scheme: <https://oip.ku.edu.tr/?q=grading-system>

**Bonus Grades:** If attendance is less than one third of the enrolled number of students in any class, I may have a quiz that will contribute 2% bonus points to your cumulative grade (total contribution cannot be over 8%). **We will observe the sky with a telescope and with the help of mobile phone applications multiple times during the semester. You will have a chance to see the details of the Moon and the planets, stars and possibly other objects with your own eyes. You are required to attend one of these sessions (%4), and attending more than one also brings 2% bonus points per session (total grade contribution cannot be over 6%).**

**Makeup Policy:** If you miss an exam and have an excuse, it is your responsibility to officiate this through the Health Center. **There will be a single makeup exam after the finals for any exam(s) you miss. This makeup exam will cover all topics.**

**Syllabus:** The textbook (3rd edition) has 12 chapters. We will spend roughly one week for each chapter (see the table below), but we can adjust our pace depending on your interest. You can also come to me with other things you want to learn that are not covered in the syllabus and we can make time for them. We will discuss space travel and exploration between Chapters 7 and 8. Time permitting, we will also discuss astrobiology, study of life beyond the Earth, during the last week. I cannot announce telescope observation times in advance unfortunately since they depend on weather conditions.

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| --- | --- | --- |
| **Week Starts** | **Lecture topics** | **Textbook (3rd edition) /EXAM** |
| 17/09 | Introduction and Discovering the Night Sky | Ch. 1 |
| 24/09 | Gravitation and the Waltz of the Planets | Ch. 2 |
| 01/10 | Light and Telescopes | Ch. 3 |
| 08/10 | The Earth and the Moon | Ch. 4 |
| 15/10 | Planets and Vagabonds of the Solar System | Ch. 5, 6 **Midterm 1 (Ch. 1 to 4)** |
| 22/10 | The Sun | Ch. 7 |
| 29/10 | Space travel and Exploration |  |
| 05/11 | Characterizing the Stars | Ch. 8 |
| 12/11 | Lives of Stars | Ch. 9 |
| 19/11 | Death of Stars | Ch. 10 **Midterm 2 (Ch. 5 to 9)** |
| 26/11 | General Relativity and Black Holes | Ch. 10 |
| 03/12 | Galaxies | Ch. 11 |
| 10/12 | Cosmology | Ch. 12 |
| 17/12 | Life Beyond Earth: Astrobiology |  |
| **TBA** | **FINAL EXAM** |  |

\*Midterm and final exams are mandatory/compulsory

\*Midterms and Final: 10 to 15 short answer questions, no multiple choice.

**INFORMATION ABOUT LABORATORIES**

Science lectures are accompanied by Laboratory Work (Lab). During the FIRST week of classes, students must attend a **mandatory laboratory orientation** at their scheduled Lab Hour. **Six laboratory experiments** will be performed during the semester. The experiment manual will be available at the copyland. You can also access the experiment sheets in the course website: <http://naturalscience.ku.edu.tr/>.

It is **compulsory to attend the Laboratories**. Each missed lab session, with or without a legitimate excuse accepted by the university, results in a ***reduction of your final course letter grade by one notch***. A grade of at least **60% is required in Lab to pass the course**, **regardless of your performance in the rest of the course**. Total Lab score is 600. If your total Lab score is below 360, you will get an F.

Whenever you have an excuse for **the missing lab, you have to contact Nazmi Yılmaz** (nayilmaz@ku.edu.tr) within 3 days and provide the relevant documents in order to arrange a make-up session. It is your responsibility to ask for a lab makeup appointment. Late requests for make-ups will not be taken into consideration.

**HONOR CODE:**

The “honor code” is in effect for all academic work at this university. **Suspected violations of the honor code will be reported to the disciplinary committee.** You are expected to do your work in a manner consistent with the principles of academic integrity at Koç University. Students and faculty adhere to the following principles of academic honesty at Koç University:

- Individual accountability for all individual work, written or oral: copying from others or providing answers and information, written or oral, to others is **cheating**.

- Proper acknowledgement of original author: Copying from another student’s paper or from another source without written acknowledgement is **plagiarism.**

- Authorized teamwork: Unauthorized help from another person or having someone else write one’s paper or assignment is **collusion**.

Cheating, plagiarism and collusion are serious offenses resulting in an F grade and disciplinary action.”

**ACADEMIC DISHONESTY**

**Plagiarism**

Plagiarism is an inclusive term that includes the actions of cheating, copying, borrowing without asking, or indicating, pretending some idea is yours when it is not, and the like. A little different from other types of ownership, the intellectual rights cover the right to the ownership of any stated idea. Again being different from other types of ownership, intellectual rights allow others to use your ideas as long as they indicate the source of the ideas and give credit. In an educational environment, intellectual rights must be most valued since this is the primary object of exchange in such environments. Therefore, every student is expected to respect the intellectual rights of others and give credit whenever necessary. You are allowed to use the ideas of others in your work such as exams and papers but you are allowed only if you indicate specifically what you have borrowed from another. For example, if you take an idea and indicate it in your own words, you should indicate the author and the source. If you take somebody else’s words directly, such as in a quote, then you should also specify page numbers. Any intellectual product that is not yours should be attributed to the right source. It really does not matter whether the intellectual property you are using is a section in a printed book, a part of another student’s assignment, or some idea you heard on a TV program. You have to give credit where it is due. Any wrongdoing in such a matter will be taken as an offense of the regulations of Koç University as well as a moral issue. Therefore, it is requested that you protect other people’s intellectual property as meticulously as you would your own material property.