



TED ÜNİVERSİTESİ

LIBE 120: Foundations and Frontiers of Science

Fall 2025 Syllabus

COURSE INFORMATION

Course Code	Course Name	Location	Time	Instructional Modality
LIBE 120	Foundations and Frontiers of Science	Multiple classrooms	Various times for different sections	Face-to-face

INSTRUCTOR INFORMATION

Prof. Dr. Mohammad Shikakhwa:

- Office: A423
- mohammad.shikakhwa@tedu.edu.tr
- Office Hours: Mon & Wed 14:00-15:30

Dr. Çağın Aksak:

- Office: -
- cagan.aksak@tedu.edu.tr
- Office Hours: By appointment

Dr. Öğr. Üyesi Onur Benli:

- Office: A416
- onur.benli@tedu.edu.tr
- Office Hours: Tue & Wed 15:00-15:50

Dr. Danjela Serim:

- Office: -
- Office Hours: By appointment
- danjela.serim@tedu.edu.tr

Course Assistants: To be announced.

GENERAL INFORMATION

Course Description

(3+0+0) 3 Credits / 6 ECTS

Prerequisites

None

Course Objectives

The main objective of this course is to provide students with knowledge of the scientific methodology and critical thinking approach as applied by the scientists in their study of natural phenomena and through the analysis of their use in real life examples from different scientific disciplines. The course aims to introduce students to a general knowledge of the basic ideas and methodologies of some of the major theories in physics, biology, geology, neuroscience/psychology, and inculcate the scientific habits of mind.

Learning Outcomes

Upon successfully completing the course, students will be able to:

1. Identify the basic constituents and terminology of scientific knowledge,
2. Apply methods of reasoning used by scientists,
3. Analyze common logical fallacies and perceptual biases that interfere with the ability to draw reasonable conclusions,
4. Discuss key theories, methodologies, and evidence from various scientific disciplines,
5. Distinguish science from pseudoscience by scientifically evaluating a wide variety of extraordinary claims that are common in our culture today.

Course Materials

Textbook(s): There is no single textbook for the course.

Recommended Readings: The readings for each week will be posted under the respective week on the course page at LMS.

Supplementary Materials: Videos to be watched will also be posted to LMS when applicable.

Student Workload

6 ETCS means a TOTAL workload of approximately 150 hours.

Planned Learning Activities and Teaching Methods

In this course, we will learn by doing things ourselves in the class, not just by listening to the instructor. The whole course is based on this learning approach. The classes will be an environment where students work on a set of tasks prepared by the instructors where they **apply** and **extend** what has been presented by the lecturer **AND in the reading material/videos assigned to them.**

ASSESSMENT METHODS

Exam(s): We will have two midterm exams and a final exam in this course. The midterm will take place around week 6 and 12. The final exam will cover the **whole course material.** A variety of question types might be expected in these exams, ranging from short response questions, e.g. true/false, multiple choice, fill in the blanks and matching tasks to more reflective open-ended questions. The weights of the exams are given below.

Assignment(s): Various assignments will be given during the course, mainly in response to assigned reading or video watching. Also, a task applying something that was discussed in class might be assigned for you to complete.

In Class Activities: The activities range from questions of the T/F or multiple-choice types to tasks and worksheets that need to be completed with students working either individually or in groups. The questions in these worksheets are very similar to the exam questions. Therefore, make sure you attend ALL classes. **Students who are inert in the workshops and are not participating in the activities will be warned, and if this behavior persists, they will be given an FX grade.**

GRADING

The course grade will be based on the following:

Component	Weight
Midterms (two MTs in total)	45%
Final Exam	35%
Assignments	20%

A score of <50% will result in an F grade for the course.

Students missing the midterm or final exam with a valid excuse, e.g. a medical condition documented by an accepted doctor report will be given makeup.

COURSE POLICIES

Professionalism: Students are expected to attend ALL the classes, participate in the activities during the workshops, and read/watch the assigned readings/videos prior to attending the classes.

Plagiarism / Academic Dishonesty: This course adheres to the academic honesty policy. We expect that all work submitted and presented by you will be your own original work and that the contributions of others will be openly acknowledged. Failure to adhere to this policy will result in disciplinary action. Although this course does not contain open-ended written assignments in general, all students are still expected to adhere strictly to the university's Academic Honesty Policy. Academic dishonesty includes, but is not limited to:

- Copying or sharing answers during exams or quizzes.
- Using unauthorized aids (such as cell phones, translators, or notes).
- Submitting work that is not your own in any take-home tasks.

Any violation of these principles will result in disciplinary action in accordance with TEDU's Principles of Academic Integrity.

<https://student.tedu.edu.tr/en/principles-academic-integrity>

Cheating: You may neither receive help from nor give help to others during an in-class exam. During exams, you may not leave the room, talk, or use dictionaries, translators, cell phones, or programmable calculators. And please keep your eyes on your own work.)

Attendance: This course requires your regular participation, attendance, and punctuality. It is expected that you will attend the class on a regular basis and be on time. It is your responsibility to keep in touch with the instructor about the emergencies prior to class. The TEDU policy concerning attendance will be followed strictly. **You cannot miss more than 12 hours in the semester even with an excuse, including medical reports.** These 12 hours are not your "Right" to miss; they should be reserved for emergencies and unexpected situations. Only, if you have a medical condition that prevents you from attending for more than 12 hours in a row, we will consider your medical report. As per the TEDU policy, exceeding the attendance limit can result in an FX grade regardless of the student's grades in the exams...etc.

Late Assignment Submission Policy: Each assignment is to be turned in on time. Arrangements for accepting late assignments will be made only in unusual circumstances (e.g., major illness, death of loved one), and only if you are able to provide documentation to support your excuse.

Extra Credit: There is no rewriting or extra credit offered on this course.

Class Participation: Each and every student MUST participate in the activities and the discussions of the class, in particular, during the workshop part of the classes. Discussions involving the whole class will follow or accompany the tasks. Students might work individually or in groups on these activities.

Class Readings: Please read the assigned articles or chapters prior to class and watch the videos posted to LMS so that you may participate fully in the course discussions. Occasionally, Reading/Video Watching drop tests will be conducted at the beginning of the classes without prior notice.

Student Support and Accommodation

Instructors will, generally, be available in their offices during office hours to provide further help and discuss any issues or difficulties that you might face. Please let us know if you want to come or try to come during the first 20 minutes of the office hours.

Student assistants (names and contacts will be shared with you in the first week of classes) will be available to help you with tasks and assignments and recite some parts of the material in case you need that. The schedule and places for the help desks will be shared with you during the first week of classes.

Announcements

All announcements will be made on the LMS site for this course. It is your responsibility to keep your e-mail address operative all times. Check your e-mails regularly in order to stay informed.

STUDENT DEVELOPMENT AND PSYCHOLOGICAL COUNSELING CENTER

Student Development and Psychological Counseling Center conducts individual

psychological counseling, group psychological counseling, preventive and developmental services such as workshops and seminars for all students in need. You may apply to our Center in order to deal with all your current problems.

For General Information: <https://csc.tedu.edu.tr/>









For Application: <https://anket.tedu.edu.tr/index.php/761882?lang=en>

TEDU WITHOUT BARRIERS UNIT

Please inform the TEDU Without Barriers Unit and the instructor of the course about the specific issues in case you have a physical or mental disability and are having trouble with anything related to this course - such as accessing the material, participating in the class, taking notes, preparing for, attending or managing to complete the exams. Your situation will be reviewed by commission, in accordance with the principle of confidentiality, and if deemed appropriate, facilitating measures will be taken so that you can take the course more efficiently.

For further information and/or questions: engelsiz@tedu.edu.tr,
<https://www.tedu.edu.tr/engelsiz-tedu>

PLANNED COURSE SCHEDULE

Week(s)	Topic
1	 Introduction: What is Science and the Scientific Method
2	 Review research abstracts; Hypotheses, Theories, Laws
3-6	 Measurement, Data representation, Graphical methods, Statistics basics
7-9	 Reasoning & Logic; Deductive, Inductive, Abductive; Correlation; Significance tests
10	 Experimentation: why and how to design good experiments
11-12	 Cell Molecular Biology, DNA, Protein Synthesis → Evolution
13-14	 Geological structure, Plate tectonics, Earthquakes & wave propagation
14	 Science vs. Non-science vs. Pseudoscience, Limitations of Science