

Course textbook: University Physics Volume 1 ( <https://openstax.org/details/books/university-physics-volume-1>)

### COURSE OUTLINE

Week	Dates	Chapter	Contents
1	29.01-04.02	1. Units and Measurement	1.1 The Scope and Scale of Physics, 1.2 Units and Standards, 1.3 Unit Conversion, 1.4 Dimensional Analysis, 1.5 Estimates and Fermi Calculations, 1.6 Significant Figures, 1.7 Solving Problems in Physics
2	05.02-11.02	2. Vectors	2.1 Scalars and Vectors, 2.2 Coordinate Systems and Components of a Vector, 2.3 Algebra of Vectors, 2.4 Products of Vectors
3	12.02-18.02	3. Motion Along a Straight Line	3.1 Position, Displacement, and Average Velocity, 3.2 Instantaneous Velocity and Speed, 3.3 Average and Instantaneous Acceleration, 3.4 Motion with Constant Acceleration, 3.5 Free Fall, 3.6 Finding Velocity and Displacement from Acceleration
4	19.02-25.02	4. Motion in Two and Three Dimensions	4.1 Displacement and Velocity Vectors, 4.2 Acceleration Vector, 4.3 Projectile Motion, 4.4 Uniform Circular Motion, 4.5 Relative Motion in One and Two Dimensions
5	26.2-03.03	5. Newton's Laws of Motion	5.1 Forces, 5.2 Newton's First Law, 5.3 Newton's Second Law, 5.4 Mass and Weight, 5.5 Newton's Third Law, 5.6 Common Forces, 5.7 Drawing Free-Body Diagrams <b>Midterm 1 (Saturday 02 March, 13:30)</b>
6	04.03-10.03	6. Applications of Newton's Laws	6.1 Solving Problems with Newton's Laws, 6.2 Friction, 6.3 Centripetal Force, 6.4 Drag Force and Terminal Speed
7	11.03-17.03	6. Applications of Newton's Laws	6.1 Solving Problems with Newton's Laws, 6.2 Friction, 6.3 Centripetal Force, 6.4 Drag Force and Terminal Speed
8	18.03-24.03	7. Work and Kinetic Energy	7.1 Work, 7.2 Kinetic Energy, 7.3 Work-Energy Theorem, 7.4 Power
9	25.03-31.03	8. Potential Energy and Conservation of Energy	8.1 Potential Energy of a System, 8.2 Conservative and Non-Conservative Forces, 8.3 Conservation of Energy, 8.4 Potential Energy Diagrams and Stability, 8.5 Sources of Energy
10	01.04-07.04	9. Linear Momentum and Collisions	9.1 Linear Momentum, 9.2 Impulse and Collisions, 9.3 Conservation of Linear Momentum, 9.4 Types of Collisions, 9.5 Collisions in Multiple Dimensions, 9.6 Center of Mass, 9.7 Rocket Propulsion
11	08.04-14.04	Holiday Week	
12	15.04-21.04	10. Fixed-Axis Rotation	10.1 Rotational Variables, 10.2 Rotation with Constant Angular Acceleration, 10.3 Relating Angular and Translational Quantities, 10.4 Moment of Inertia and Rotational Kinetic Energy, 10.5 Calculating Moments of Inertia, 10.6 Torque, 10.7 Newton's Second Law for Rotation, 10.8 Work and Power for Rotational Motion <b>Midterm 2 (Saturday 20 April, 13:30)</b>
13	22.04-28.04	11. Angular Momentum	11.1 Rolling Motion, 11.2 Angular Momentum, 11.3 Conservation of Angular Momentum, 11.4 Precession of a Gyroscope
14	29.04-05.05	13. Gravitation	13.1 Newton's Law of Universal Gravitation, 13.2 Gravitation Near Earth's Surface, 13.3 Gravitational Potential Energy and Total Energy, 13.4 Satellite Orbits and Energy, 13.5 Kepler's Laws of Planetary Motion, 13.6 Tidal Forces, 13.7 Einstein's Theory of Gravity
15	06.05-12.05	15. Oscillations	15.1 Simple Harmonic Motion, 15.2 Energy in Simple Harmonic Motion, 15.3 Comparing Simple Harmonic Motion and Circular Motion, 15.4 Pendulums, 15.5 Damped Oscillations, 15.6 Forced Oscillations
16	13.05-19.05	Review	

#### Other Recommended Textbooks:

1. Young & Freedman, *University Physics*, (15<sup>th</sup> Ed.) Pearson
2. Jewett and Serway, *Physics for Scientists and Engineers* (7<sup>th</sup> Ed.), Thomson
3. Giancoli, *Physics for Scientists & Engineers* (4<sup>th</sup> Ed.), Pearson.

**Course Web Page:** You can find useful information concerning the course, including a copy of this syllabus, a list of staff, past exam solutions, etc., at <http://www.fen.bilkent.edu.tr/~phys101/> .

**Laboratory Web Page:** Information on the laboratory work can be found at <http://www.fen.bilkent.edu.tr/~physlab/> .

### Grading Scheme:

Midterm Exam 1: 15%, Midterm Exam 2: 20%, Final Exam: 25%, Laboratory Work: 20%, Quizzes 10%, Homework 10%

### Letter Grade Bins:

**A** [100,85], **A-** (85, 80], **B+** (80, 75], **B** (75, 70], **B-** (70, 65], **C+** (65, 60], **C** (60, 55], **C-** (55, 50], **D+** (50, 45], **D** (45, 40], **F** (40, 0]

### Important Note:

Students will not be admitted into the final exam, and will receive an automatic **FZ** grade if:

- the lab grade is not a passing grade, i.e., less than 60;
- the weighted average of the two midterm grades is less than 30;

### Midterm Exam Dates:

Midterm Exam 1: 2 March 2024, 13:30, Midterm Exam 2: 20 April 2024, 13:30

### General Information About Exams:

- All students should comply with the Honor Code. They will be asked to sign the following code for their exams to be graded: *"I pledge, on my Honor, not to lie, cheat, or steal in either my academic or personal life. I understand that such acts violate the Honor Code and undermine the community of trust of which we are all stewards."*
- The exams will be common and will be administrated to all students at the same time. Questions and their solutions for each exam will be prepared by the exam committee and will be available on the course web site following the exam.
- Exam papers will be graded by the instructors. Each question will be graded by one instructor.
- Make-up exams for the midterms will be administrated in the last week of courses. Make-up for the final exam will be administrated within five work days following the final exam. Students are expected to present a valid medical report to their Dean's office within two work days to be able to sit in the make-up exam (University Rules and Regulations for Undergraduate Studies, Item No. 4.8).
- Students will have the right to ask for a reassessment of their exam paper **within five work days** after the announcement of their grades (University Rules and Regulations for Undergraduate Studies, Item No. 4.12). Reassessment applications should be done after a careful examination of the solutions posted on the web, and should contain a detailed description stating why the exam paper should be reassessed. Applications without a valid reason will mean that solutions are still not well understood, and therefore will result in further deduction of marks.
- Students who received **FZ** grades will not be admitted to the final exam. Attempting to take the final exam after receiving an **FZ** grade will result in a disciplinary action.

### Quizzes

During the semester, a minimum of 10 short (15 min.) quizzes will be given. Average of these quiz marks will comprise 10% of each student's final grade.

### Homework

Regular homework assignments will be given and monitored by the coordinator through the online tutoring and homework system "CENGAGE WebAssign™." This website will also provide a grading procedure for each student. The overall homework grade will make up 10% of the final grade.

To register on the website, you need an access code. If you have previously purchased a code for physics, you can use your old WebAssign code. If you don't have one, you can purchase it from the Meteksan bookstore.

When registering, remember to enter your Bilkent student ID number. Your homework grades will be retrieved from the WebAssign server using your student ID number. If you forget to enter it or input the wrong number, you won't receive a homework grade even if you complete the assignments.

To register for the PHYS 101 course, visit the website:

<https://www.getenrolled.com/?courseKey=bilkent.tr59756656>

The Class key field will be pre-filled for you (bilkent.tr 5975 6656); simply proceed to complete the registration.

You can find information on how to use WebAssign, along with registration guidelines, by watching the video at

<https://www.youtube.com/watch?v=2eP385K0djg>

### **Moodle**

This course will require students to use the new integrated STARS/Moodle system. For this students must first create a Moodle account and then enrol (register) themselves to the desired Moodle course pages. Students can login the server using the "Moodle" button on their SRS screens. This must be done at least once at the beginning of the semester to create a Moodle account. Previous semester Moodle accounts will not work on the new server.

To access the course on Moodle students should:

1. Log in the STARS system
2. Click on the "Moodle" button next to the course PHYS 101 All Sections

If you experience any problems, please contact [moodle@bilkent.edu.tr](mailto:moodle@bilkent.edu.tr).

### **Labs**

Please refer to the lab web page ([www.fen.bilkent.edu.tr/~physlab/](http://www.fen.bilkent.edu.tr/~physlab/)) for detailed information.

### **Attendance**

According to Bilkent University Rules and Regulations attendance to lectures is compulsory. It will be monitored by the instructor regularly.

### **Gen. AI Policy**

Gen.AI, a powerful artificial intelligence tool, can be utilized as a supplementary resource to enhance learning and assist with certain academic tasks. However, there are specific restrictions in place to maintain the integrity of academic assessments.

Students are allowed to use Gen.AI for the following activities:

- a. Studying and Homework: - Utilizing Gen.AI to seek additional explanations, clarifications, and examples related to the subjects being studied. - Generating ideas, outlines, or drafts for homework assignments.
- b. Research Assistance: - Employing Gen.AI to gather information, explore concepts, and enhance understanding of course materials.
- c. Conceptual Understanding: - Interacting with Gen.AI to deepen comprehension of theoretical concepts covered in lectures.

The use of Gen.AI is strictly prohibited for the following activities:

- a. Lab Reports: - Generating content for lab reports, including analysis, results, and conclusions. - Any involvement of Gen.AI in the creation of formal lab reports is considered a breach of academic integrity.
- b. Lab Project Work: - Using Gen.AI to contribute to the design, execution, or analysis of laboratory projects. - All aspects of lab project work should be the result of individual effort without assistance from Gen.AI.

**Best wishes for a healthy and prosperous semester.**