

Course textbook: D. Giancoli, Physics for Scientists and Engineers with Modern Physics, (5 th Ed.) Pearson

COURSE OUTLINE			
Week	Dates	Chapter	Contents
1	16.09-20.09	Ch. 1 Introduction, Measurement, Estimating	How Science Works; Models, Theories, and Laws; Measurement and Uncertainty; Significant Figures; Units, Standards, and the SI System; Converting Units; Order of Magnitude, Rapid Estimating; Dimensions and Dimensional Analysis
2	21.09-27.09	Ch. 2 Describing Motion: Kinematics in one Dimension	Reference Frames and Displacement; Average Velocity; Instantaneous Velocity; Acceleration; Motion at Constant Acceleration; Solving Problems; Freely Falling Objects
3	28.09-04.10	Ch. 3 Kinematics in Two or Three Dimensions; Vectors	Vectors and Scalars; Addition of Vectors – Graphical Methods; Subtraction of Vectors, and Multiplication of a Vector by a Scalar; Adding Vectors by Components; Unit Vectors; Vector Kinematics; Projectile Motion; Solving Problems Involving Projectile Motion; Relative Velocity
4	05.10-11.10	Ch. 4 Dynamics: Newton's Laws of Motion	Force; Newton's First Law of Motion; Mass; Newton's Second Law of Motion; Newton's Third Law of Motion; Weight – the Force of Gravity, and the Normal Force; Free Body Diagrams
5	12.10-18.10	Ch. 5 Using Newton's Laws: Friction, Circular Motion, Drag Forces	Using Newton's Laws with Friction; Uniform Circular Motion – Kinematics; Dynamics of Uniform Circular Motion; Highway Curves – Banked and Unbanked; Nonuniform Circular Motion; Velocity Dependent Forces – Drag, and Terminal Velocity
6	19.10-25.10	Catch up and Review	Midterm Exam 1 (Saturday, 24 October 2026)
7	26.10-01.11	Ch. 6. Gravitation and Newton's Synthesis	Newton's Law of Universal Gravitation; Vector Form of Newton's Law of Universal Gravitation; Gravity Near the Earth's Surface; Satellites and "Weightlessness"; Planets, Kepler's Laws and Newton's Synthesis; Types of Forces in Nature
8	02.11-08.11	Ch. 7 Work and Energy	Work Done by a Constant Force; Scalar Product of Two Vectors; Work Done by a Varying Force; Kinetic Energy and the Work – Energy Principle
9	09.11-15.11	Ch. 8 Conservation of Energy	Conservative and Nonconservative Forces; Potential Energy; Mechanical Energy and Its Conservation; Problem Solving Using Conservation of Mechanical Energy; The Law of Conservation of Energy; Energy Conservation with Dissipative Forces; Gravitational Potential Energy and Escape Velocity; Power; Potential Energy Diagrams; Stable and Unstable Equilibrium
10	16.11-22.11	Ch. 9 Linear Momentum	Momentum and Its Relation to Force; Conservation of Momentum; Collisions and Impulse; Conservation of Energy and Momentum in Collisions; Elastic Collisions in one Dimension; Inelastic Collisions; Collisions in 2 or 3 Dimensions; Center of Mass (CM); Center of Mass and Translational Motion; Systems with Variable Mass; Rocket Propulsion
11	23.11-29.11	Catch up and Review	Midterm Exam 2 (Saturday, 28 November 2026)
12	30.11-06.12	Ch. 10 Rotational Motion	Angular Quantities; Vector Nature of Angular Quantities; Constant Angular Acceleration; Torque; Rotational Dynamics: Torque and Rotational Inertia; Solving Problems in Rotational Dynamics; Determining Moments of Inertia; Rotational Kinetic Energy; Rotational Plus Translational Motion; Rolling
13	07.12-13.12	Ch. 11 Angular Momentum; General Rotation	Angular Momentum – Objects Rotating about a Fixed Axis; Vector Cross Product; Torque as a Vector; Angular Momentum of a Particle; Angular Momentum and Torque for a System of Particles; General Motion; Angular Momentum and Torque for a Rigid Object; Conservation of Angular Momentum; Rotating Frames of Reference; Inertial Forces
14	14.12-20.12	Ch. 14 Oscillations	Oscillations of a Spring; Simple Harmonic Motion; Energy in the Simple Harmonic Motion; Simple Harmonic Motion Related to Uniform Circular Motion; The Simple Pendulum; the Physical Pendulum and the Torsion Pendulum; Damped Harmonic Motion
15	21.12-25.12	Catch up and Review Classes End (25 December 2026)	

Other Recommended Textbooks:

1. Serway & Jewett, Physics for Scientists and Engineers (10 th Ed.), Cengage
2. Young and Freedman, University Physics, (15 th Ed.) Pearson
3. University Physics Volume 1 (<https://openstax.org/details/books/university-physics-volume-1>)

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, including the weekly schedule and the semester plan, can be found at <http://www.fen.bilkent.edu.tr/~physlab/>

Grading Scheme:

Midterm Exam 1: 20%, Midterm Exam 2: 20%, Final Exam: 30%, Laboratory Work: 20%, Quizzes 10%

Important Note:

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

- their lab grade is not a passing grade, i.e., less than 60.
- the weighted average of their Midterm 1 and Midterm 2 is below 30 . $\left[\frac{0.2 \times MT1 + 0.2 \times MT2}{0.4} < 30 \right]$
- their attendance is less than 70%.

Midterm Exam Dates:

Midterm Exam 1: Saturday, 24 October 2025, Midterm Exam 2: Saturday, 28 November 2025

General Information About Exams:

- All students should comply with the Honor Code. They will be asked to sign the following code on the cover sheet of the exam questions 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.
- Students are not allowed to use calculators during exams. No cell phones will be admitted into the exam room. They will be collected prior to the exam and will be handed back afterwards.
- Students should be present in the designated rooms announced before the start of the exam, and should have their Bilkent ID cards on them. Exam proctors will have a list of students assigned to each location and will not accept students whose name is not on the list. Students who are late for more than 20 minutes will not be allowed to take 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 made in person to the lecturer of the section with a petition stating in detail why the exam paper should be reassessed. Students should be aware that their grade could increase or decrease following a reassessment.
- 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 (10 min.) quizzes will be administrated at the end of a class period. Results of these quizzes will comprise 10% of each student’s final grade.

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 enroll (register) themselves to the desired Moodle course pages. Students can login the server using the “Moodle” button on their STARS 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. Please refer your students to their Moodle account for the common syllabus, current and past exams, necessary forms and announcements.

To access the course on Moodle students should:

1. Log in the STARS system
2. Click on the “Moodle” button next to the name of the relevant course

If you experience any problems, please contact moodle@bilkent.edu.tr.

Labs

Labs will start during the second week of the semester (21 September 2026). Please refer to the lab web page (www.fen.bilkent.edu.tr/~physlab/) for more information on all lab-related questions.

Attendance

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

Gen.AI Policy

Information on Gen.AI policy for students can be found at http://www.fen.bilkent.edu.tr/~phys101/GenAI_Policy.pdf

Best wishes for a prosperous semester.