

**Course textbook:** Giancoli, *Physics for Scientists & Engineers with Modern Physics*, (4<sup>th</sup> Ed.) Pearson

### COURSE OUTLINE

Week	Dates	Chapter	Contents
1	29.01-02.02	1+2 Introduction, Measurement, Estimating, Describing Motion: Kinematics in One Dimension	The Nature of Science, Models, Theories and Laws, Measurement and Uncertainty; Significant Figures, units and Standards, and the SI System, Converting Units, Order of Magnitude; Rapid Estimating, Reference Frames and Displacement, Average Velocity, Instantaneous Velocity, Acceleration, Motion at Constant Acceleration, Solving Problems, Freely Falling Objects
2	05.02-09.02	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
3	12.02-16.02	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, Solving Problems With Newton's Laws: Free-Body Diagrams, Problem Solving- A General Approach
4	19.02-23.02	5 Using Newton's Laws: Friction, Circular Motion	Applications of Newton's Laws Involving Friction, Uniform Circular Motion - Kinematics, Dynamics of Uniform Circular Motion, Highway Curves: Banked and Unbanked
5	26.02-02.03	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: Geophysical Applications, Satellites and "Weightlessness", Kepler's Laws and Newton's Synthesis
	<b>03.03.2018</b>		<b>Midterm Exam 1</b>
6	05.03-09.03	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
7	12.03-16.03	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: Solving Problems, Gravitational Potential Energy and Escape Velocity, Power
8	21.03-23.03	Spring Break	
9	26.03-30.03	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 Two or Three Dimensions, Center of Mass, Center of Mass and Translational Motion
10	02.04-06.04	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
11	09.04-13.04	11 Angular Momentum and General Rotation	Angular Momentum - Objects Rotating About a Fixed Axis, Vector Cross Product; Torque as a Vector, Angular Momentum of a Particle
12	16.04-20.04	Review	
	<b>21.04.2018</b>		<b>Midterm exam 2</b>
13	24.04-27.04	11 Angular Momentum and General Rotation	Angular Momentum and Torque for a System of Particles; General Motion, Angular Momentum and Torque for a Rigid Object, Conservation of Angular Momentum
14	02.05-04.05	14 Oscillators	Oscillations of a Spring, Simple Harmonic Motion, Energy in the Simple Harmonic Oscillator, Simple Harmonic Motion Related to Uniform Circular Motion, The Simple Pendulum, The physical Pendulum and the Torsional Pendulum, Damped Harmonic Motion
15	07.05-14.05	Review	

#### Other Recommended Textbooks:

1. Jewett and Serway, *Physics for Scientists and Engineers 7<sup>th</sup> Ed.* Thomson
2. Young and Freedman, *University Physics Vol. 1 (13<sup>th</sup> Edition)*, Pearson.

### 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 **FZ** grade if:

- their lab grade is not a passing grade, i.e., less than 60;
- the sum of their Midterm 1 and Midterm 2 grades is less than 60;
- their attendance is less than 70%.

### Midterm Exam Dates:

Midterm Exam 1: 03March 2018, Saturday (14:00 hrs.)

Midterm Exam 2: 21April 2018, Saturday (14:00 hrs.)

### 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.
- One make-up exam for the midterms will be given in the last week of courses. Make-up for the final exam will be administrated before the deadline for the submission of letter grades. To be able to sit in the make-up exams, students are expected to present a valid medical report to their Dean's office in accordance with 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 forms will be available on the course website. Students should use this form and write a detailed objection stating why their 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.

### Homework

Homework problems will be assigned and monitored regularly by the coordinator using the online tutoring and homework system "MasteringPhysics™ ([www.masteringphysics.com](http://www.masteringphysics.com))" of the textbook. The website will also provide a grading procedure for each student which will comprise 10% of the final grade.

To be able to sign in at Mastering URL "[www.masteringphysics.com](http://www.masteringphysics.com)" students will have to register online. To register one needs:

- A valid e-mail address.
- The student access code that is printed on the card which can be found inside the textbook.
- Instructor's course ID which, for Phys.101, is **P101S1718**.

The access code is unique and hence, each student must have his own copy of the textbook.

To register students should:

- Go to the Mastering URL [www.masteringphysics.com](http://www.masteringphysics.com)
- Click "Student" under "Register" to register for MasteringPhysics with the student access code
- On the next screen, click "Outside US and Canada"
- Click "Yes I have a Course ID" and enter the course ID provided by the instructor to the box and click "Go"
- Choose "Yes I have an access code" and click "Next"
- Read and accept the licence agreement to continue registration
- Follow the on screen instructions on next page, enter the access code and complete the registration.

Registration information will also be emailed to the user for records.

After registration one can sign in at any time.

To access the course students should:

- Go to "www.masteringphysics.com"
- Click "Sign In"
- Enter the login credentials and click "Sign In"
- Enter the Course ID once again to enrol to the instructor's course.

After the enrolment one can follow the assignments from the main page.

In case of difficulties, one can contact Pearson at [destek@pearson.com](mailto:destek@pearson.com) e-mail address by providing the unique access code, course ID, e-mail address and an explanation of the problem.

### **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 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](mailto:moodle@bilkent.edu.tr).

Students will also be able to access Pearson's "MasteringPhysics" server to work on their homework from their Moodle screens.

### **Recitations**

The 4<sup>th</sup> (in some sections 3<sup>rd</sup>) hour of each week will be used as a recitation hour in which assistants will solve example problems in class.

### Weekly Recitation Program

<b>Week</b>	<b>Material</b>
1	Ch. 2 Describing Motion: Kinematics in One Dimension
2	Ch. 3 Kinematics in Two or Three Dimensions; Vectors
3	Ch. 4 Dynamics: Newton's Laws of Motion
4	Ch. 5 Using Newton's Laws: Friction, Circular Motion
5	Ch. 6 Gravitation and Newton's Synthesis
6	Ch. 7 Work and Energy
7	Ch. 8 Conservation of Energy
8	No Recitation
9	Ch. 9 Linear Momentum
10	Ch. 10 Rotational Motion
11	Ch. 11 Angular Momentum and General Rotation
12	Review Problems
13	Ch. 11 Angular Momentum and General Rotation
14	Ch. 14 Oscillators
15	Review Problems

### Labs

Labs will start during the second week of the semester with an orientation meeting.

Please refer to the lab web page ([www.fen.bilkent.edu.tr/~physlab/](http://www.fen.bilkent.edu.tr/~physlab/)) for more information on all lab-related questions.

For laboratory inquiries send e-mail to your lab assistant. You can find the name and e-mail address of your lab assistant on the course web page under the "Staff" menu.

**Best wishes for a prosperous semester.**