PHYS 105 Physics I – Section 01
Fall-2016 Syllabus

Required or Elective	■ Required ☐ Elective	**Date**	September 26, 2016
Semester	■ Fall 2016–17 ☐ Spring 2016–17 ☐ Summer 2016–17	**Class Hours**	Monday 11:00 – 13:50 A 111L Tuesday 11:00 – 12:50 K 183 Wednesday 14:00 – 14:50 K 183
Course Credit Hours/ ECTS	(3,0,2) 4 / 6 ECTS	**Pre-requisite/ Co-requisite**	None
Level of Course	Freshman	**Language of Instruction**	■ English ☐ Turkish
Instructor	Prof. Dr. Şinasi Ellialtıoğlu	**Instructor's Office Hours**	Wednesday 11:00–12:00 and/or by appointment
Instructor's Office	Building A, Rm. 411 0 (312) 585 00 18	**Instructor's e-mail**	sinasi.ellialtioglu@tedu.edu.tr
Teaching Assistant	Ömer Can Pamuk Building B, Rm. 343	**Teaching Assistant's Phone and e-mail**	0 (312) 585 00 54 omer.pamuk@tedu.edu.tr

Course Description	Vectors and coordinate systems; kinematics, dynamics, Newton's Laws of motion. Charge; electric field, Gauss' law; electric potential; capacitors; DC circuits. Temperature; Zeroth law of thermodynamics; Thermal expansion; Ideal gas law.
Course Learning Outcomes	On successful completion of this module, the students should be able to: 1. Convert (C) the verbal description of a problem into the language of physics, sketch (a) a diagram to analyze (A) it in terms of the known and unknown physical quantities. 2. Apply (a) the fundamental principles of physics, like the three laws of Newton, Gauss' Law, Kirchhoff's rules or the Zeroth law of thermodynamics; expressed as (C) mathematical equations involving the known/unknown physical quantities for any given problem, and then solve (a) them for the unknowns. 3. Recognize (a) differentiation as a tool to evaluate (E) the slope of a curve or integration as a tool to evaluate (E) the area under a curve, respectively, in determining related physical quantities. 4. Evaluate (E) the correct number of significant figures for each parameter in the given problem; perform calculations using estimates of order of magnitudes, and carry out unit algebra. 5. Employ (a) the vector notation in order to identify (C) the components of multidimensional problems and evaluate (E) each independently. 6. Express (C) verbally and in writing the concepts, processes and results in general physics effectively and competently. **Bloom's Taxonomy Levels:** **(C) Comprehension, (a) Application, (A) Analyze, (E) Evaluate.**

Student Workload (Total 180 hrs.)	■ Lectures..... **50** hrs. ■ Course Readings..... **25** hrs. ☐ Online Discussions ..... **0** hrs. ■ Exams/Quizzes ..... **20** hrs.	■ Laboratory Applications ..... **30** hrs. ☐ Oral Presentation ..... **0** hrs. ☐ Poster Presentation..... **0** hrs. ■ Other: Online Homework ..... **50** hrs.

Textbook	Giancoli, "Physics for Scientists and Engineers, with Modern Physics", 4th Edition, 2009.
Recommended Readings	– Halliday, Resnick, and Walker, "Principles of Physics", 9th Edition, 2011. – Jewett and Serway, "Physics for Scientists and Engineers, with Modern Physics", 8th Edition, 2009. – Young and Freedman, "University Physics with Modern Physics", 13th Edition, 2011.
Module and Instructor Evaluation Date	Evaluation will be held on **December 28, 2016 Thursday**, in class.
Computer Usage	The Mastering Physics (MP) online homework system will be used for homework assignments. In order to access online homework problems, students are expected to obtain a copy of the textbook with "Student Access Kit" from TEDU Bookstore. (http://www.masteringphysics.com) Sign up for "**F16PHYS105ELLIALTIOGLU**"

TENTATIVE COURSE OUTLINE		
WEEK	**Topics**	**Objectives**
1	Ch.2 Sec. [1-7] • Kinematics in one dimension • Constant acceleration case • Free fall	Describe straight-line motion in terms of velocity and acceleration. Interpret graphs of position, velocity and acceleration as functions of time.
2	Ch. 3 Sec. [1-9] • Vectors • Kinematics in 2D and 3D • Projectile motion, Relative motion	Introduce vectors in Cartesian and polar coordinates, their addition graphically and also algebraically in terms of their Cartesian components. Utilize unit vectors. Solve problems for two-dimensional motion by decomposing it into its components. Describe the curved path of a projectile.
3	Ch. 4 Sec. [1-8] • Dynamics • Newton's three laws of nature	Introduce the concept of force and relate it to the mass and acceleration of the object in motion. Analyze and utilize Newton's laws of motion using free-body diagrams.
4	Ch. 5 Sec. [1-4] • Various forces	Weight, normal force, contact force, tension, friction force, spring force, centripetal force, drag force.
5	• Friction • Circular motion	Static and kinetic friction forces. Relate centripetal force to velocity of the particle and the radius of its circular path.
5/11	**EXAM 1**	
6	Ch.21 Sec. [1-3, 5, 6, 8, 9] • Electric charge • Coulomb's law • Electric field	The nature of electric charge, another conserved quantity. Electric forces between charges, another inverse square law. The distinction between electric force and electric field. Electric field due to discrete and continuous distribution of charges. Electric field lines.
7	Ch.22 Sec. [1-3] • Electric flux • Gauss' Law	Gauss's law that relates electric flux through a closed surface and the charge enclosed by the surface. Charge resides on the surface of a conductor.
8	Ch.23 Sec. [1-3,5,8] • Electric potential • Equipotential surfaces • Electrostatic potential energy	The electric potential energy of, and electric potential due to a collection of charges. Use the electric potential surface to visualize the variation of the electric filed in space, and to calculate the electric field at any point.
9	Ch.24 Sec. [1, 4, 5] / Ch.25 Sec. [1, 2] • Capacitors • Dielectrics • Electric current	The nature of capacitors. Capacitance as the measure of ability to store charge. Capacitors connected in a circuit. Energy stored in a capacitor and the effects of dielectrics. Charge flow in a conductor.
10	Ch.25 Sec. [3-5,7] • Ohm's law • Resistance, Electric power	Meaning of the resistivity and the conductivity in a material, and their relation to the shape and dimensions of the conductor. Calculation of energy and power in circuits.
11	Ch.26 Sec. [1–4] • EMF in series and in parallel • Direct-current circuits • Kirchhoff's rules	Electromotive force (emf), that causes the current to flow in a conductor. Circuits with multiple resistors in series or parallel. Kirchhoff's rules applied to circuits with more than one loop. *RC* circuits.

17/12	**EXAM 2**	
12	Ch.17 Sec. [1–3] • Atomic theory of matter • Temperature & thermometers • Zeroth law of thermodynamics	Motion in microscopic scale. The temperature and measurement of temperature. Temperature scales. Thermal equilibrium between systems.
13	Ch.17 Sec. [4–5] • Thermal expansion • Thermal stresses	Expansion of length of a material due to temperature change. Stress resulting temperature change.
14	Ch.17 Sec. [6–9] • The Ideal Gas Law • Avagadro's number	Relation between gas volume and pressure in constant temperature: Boyle's law. Effect of temperature on gas volume: the ideal gas law.
15–16	**FINAL EXAM WEEKS, January 2–14, 2017 (date and time to be announced later).**	

COURSE ASSIGNEMENTS
A. Quiz [5%]
There will be 3 quizzes given which will be held in class hours.
B. Online Homework Assignments [15%]
There will be one online homework assignment every month. Each will contain 6 problems and the access will be unavailable after their deadlines.
C. Laboratory [15%]
There will be six experiments.
D. Exams [20% + 20%]
There will be 2 one-hour exams: Exam 1 is on **November 5, 2016**; covering the Chapters 1–5; Exam 2 is on **December 17, 2016**; covering the Chapters 21–26.
E. Final Exam [25%]
There will be a **cumulative** final. Date of the final exam will be announced at the end of the semester.

COURSE ASSESSMENT AND LEARNING OUTCOMES MATRIX	
Assessment Methods	**Course Learning Outcomes**
Monthly Quizzes	1, 3, 4, 6
Bi-weekly online homework assignments	1, 2, 3, 4, 5
Exam 1	1, 2, 3, 4, 6
Exam 2	1, 2, 4, 6
Final Exam	1, 2, 4, 5, 6

GRADING SCALE		
Grades	**Grade Points**	**Percentage Scores**
AA	4.00	90 – 100
BA	3.50	85 – 89
BB	3.00	80 – 84
CB	2.50	75 – 79
CC	2.00	70 – 74
DC	1.50	60 – 69
DD	1.00	50 – 59
F	0.00	0 – 49
FX	0.00	–
P	–	–

CONTRIBUTION TO PROGRAM OUTCOMES					
PO	**EEE**	**IE**	**CMPE**	**ME**	**CE**
1	✓	✓	✓	✓	✓
2			✓	✓	✓
3		✓	✓	✓	✓
4	✓	✓			
5	✓				

CONTRIBUTION TO PROGRAM OUTCOMES
I. Attendance
You are expected to attend all classes. Classes start on the hour. Please be respectful of your classmates by being on time. Cell phones should be turned off and kept out of sight.
II. Calculator Policy
Cell phones will not be allowed in the exam, your own calculator is allowed.
III. Tutoring
In addition to office hours, there will be tutoring hours offered by appointment to get help. If you feel that you need to sign up for tutoring, please visit Dr. Mana Ece Tuna (Rm. 147, Phone: 585 00 45, e-mail: mana.tuna@tedu.edu.tr) for necessary arrangements.
IV. Plagiarism
Collaboration on non-collected homework and in studying is strongly encouraged; however, the work you hand in must be solely your own. Sharing written work before it is turned in to be graded as academic dishonesty. For more information on TEDU policy on intellectual integrity see the link http://www.tedu.edu.tr/Assets/Documents/News/Public/TEDU_Ogrenci_El_Kitabi_2012.pdf.
V. Disability Support
If you have a disabling condition which may interfere with your ability to successfully complete this module, please contact Dr. Tolga İnan (e-mail: tolga.inan@tedu.edu.tr). For more information please see Handbook for Registered Students.
VI. Make Up Exams
Make-up exams for Exam 1 and 2 will not be offered generally. If you have a legitimate reason for missing an exam, then you must arrange to make up the exam before the scheduled time of the exam. The only exceptions are illness or emergency (e.g., death in family, a traffic accident, etc.). In case of an illness or emergency you need to supply a documentation that supports your claim. The dates for make-up exam for Final are decided by Make-up Exam Commission according to the rules and regulation of TEDU. Please see the link http://www.tedu.edu.tr/en-US/Content/Default.aspx?SectionID=114. Also please read the document given in the link http://www.tedu.edu.tr/tr-TR/Content/Akademik/Akademik_Belgeler/Yonetmelikler_ve_Yonergeler.aspx.