ATILIM UNIVERSITY
FACULTY OF ENGINEERING
PHYSICS GROUP

PHYS 101 - General Physics I (Mechanics)

COURSE DESCRIPTION & SYLLABUS
2020-2021 Spring Semester

Course Coordinator: Doç. Dr. Mehmet Işık

Instructors: Prof. Dr. Yasemin Saraç, Prof. Dr. Sefer Bora Lişesivdin, Doç. Dr. Mehmet Işık,
Laboratory Assistants: Duygu Lale Tuna, Onur Durhan, Cansu Emir, İrem Yılmaz

Course Language: English

Course hours: 3-hours lecture + 2-hours laboratory practice

Course ECTS: 6 (3,2,0)

Course objective: The goal of this course is to establish the first bridge between physics and engineering and to apply physics in defining, modelling, and solving engineering problems for the first time in the engineering student's career. To this end, the student is provided with the calculus-based concepts of mechanics.

General learning outcomes of the course:

1. Understand and apply the methods of solving elementary mechanics problems that lead to the first insights into the fundamentals of related fields in engineering sciences.
2. Understand conceptually the topics of mechanics and apply them to basic engineering problems.
3. Apply and integrate the concepts of physics and the principles of engineering sciences into a working practical knowledge.
4. Eenhance the student's ability and motivation to solve seemingly difficult problems in various fields.
5. Provide the student with a fruitful and friendly introduction to the subject by giving them the opportunity to establish conceptual relations between mechanics and a wide range of topics in engineering disciplines.

Sources:

1. **Course Book:**
   - *Physics for Scientists & Engineers with Modern Physics* by Giancoli (4th Edition), Pearson – (2014)

2. **Supplementary Books:**

- *Principles of Physics* by Halliday, Resnick, and Walker (10th Edition), John Wiley (2014)
- *Physics for Scientists and Engineers* by Knight (2nd Edition), Pearson – Addison Wesley (2008)
- *Physics for Scientists and Engineers* by Jewett and Serway (8th Edition), Brooks / Cole Cengage Learning (2010)
- *University Physics* by Bauer and Westfall, McGraw – Hill (2011)
- *Sears and Zemansky's University Physics* by Young and Freedman (12th Edition), Pearson – Addison Wesley (2008)

Contents of the course:

Chapter 1. Introduction, Measurement, Estimating
Chapter 2. Kinematics in One Dimension
Chapter 3. Kinematics in Two or Three Dimensions; Vectors
Chapter 4. Newton's Laws of Motion
Chapter 5. Using Newton's Laws: Friction, Circular Motion
Chapter 7. Work and Energy
Chapter 8. Conservation of Energy
Chapter 9. Linear Momentum
Chapter 10. Rotational Motion
Chapter 11. Angular Momentum; General Rotation

Evaluation:

- First Midterm: 20%
- Second Midterm: 20%
- Final Exam: 30%
- Laboratory work: 15%
- Homework: 15 %

Laboratory regulations:

- Laboratory lessons will be held on via zoom. You are not allowed to attend a laboratory zoom session if you happen to be late more than 15 minutes. If you want, you can attend another suitable zoom session.
- A medical report (approved by the head of the department) is mandatory in order to have a make-up laboratory session.
- Experiments will be done through the simulation program. Your computer must have Java Word and Excel programs. **You must complete experiments individually, not as a group.**
- After completing your experiment reports, you need to upload them to the relevant part in the laboratory section in the **ATILIM PHYS101 MOODLE PAGE**. The file you upload must be in **PDF format** with just one PDF file for each experiment. Files in other formats (WORD, ZIP, PNG, etc) will not be accepted by the system. The size of the PDF file you upload should be a maximum of 20 MB. The system will automatically shut down after the deadline given for the experiment. You need to pay attention to the deadline. **Late submissions will not be accepted**.
- ***This semester you will have 6 experiments with 15 points each. Only those who obtain at least 9 points, out of 15, are considered successful. The others will fail in both the laboratory work and the course*. If you do not participate in 2 of 6 experiments, you will be immediately fail the laboratory section. Students who fail the physics laboratory course also fail the physics course.**
- You need scientific calculator.
- All grades are periodically announced. Keep on checking regularly all your grades. Objections are to be considered only at laboratory zoom session.
- If you have any questions about the laboratory, you can send e-mails to the following addresses:
  - onur.durhan@atilim.edu.tr
  - cansu.emir@atilim.edu.tr
  - irem.yilmaz@atilim.edu.tr
  - duygu.tuna@atilim.edu.tr

Laboratory evaluation:

- 15 points for reports