



**ATILIM UNIVERSITY
FACULTY OF ENGINEERING
PHYSICS GROUP**

PHYS 102 - General Physics II (Electricity and Magnetism)

COURSE DESCRIPTION & SYLLABUS

2023-2024 Spring Semester

Course Coordinator: Prof. Dr. Mehmet Işık

Instructors: Prof. Dr. Yasemin Saraç, Prof. Dr. Filiz Korkmaz Özkan, Prof. Dr. Mehmet Işık, Doç.Dr. Hüseyin Oymak, Doç. Dr. Özge Sürücü, Dr. Öğr. Üyesi Murat Mesta

Laboratory Assistants: Duygu Lale Nasöz, Onur Durhan, Cansu Emir, Dilek Demiroğlu Günöven

Course Language: English

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

Course ECTS: 6 (3,3,0)

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 electromagnetism.

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. Enhance 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 21. Electric Charge and Electric Fields

Chapter 22. Gauss' Law

Chapter 23. Electric Potential

Chapter 24. Capacitance, Dielectrics, Electric Energy Storage

Chapter 25. Electric Currents and Resistance

Chapter 26. DC Circuits

Chapter 27. Magnetism

Chapter 28. Sources of Magnetic Field

Chapter 29. Electromagnetic Induction and Faraday's Law

Chapter 30. Inductance

Evaluation:

- Midterm 1: 20%
- Midterm 2: 20%
- Final: 25%
- Laboratory work: 20%
- Homework: 15%

Laboratory regulations:

- Experiments are held face to face in the laboratory.
- A student who does not attend the laboratory is to be graded zero.
- A medical report (approved by the head of the department) is mandatory in order to have a make-up laboratory session.
- You are not allowed to attend a laboratory session if you happen to be late more than 15 minutes.
- **Only those who obtain at least 12 points, out of 20, are considered successful. The others will fail in both the laboratory work and the course.**
- You cannot eat, drink, or smoke during any laboratory session.
- **You must bring your own laboratory manual and a scientific calculator. You cannot use your mobile phone as a calculator.**
- Try not to use your mobile phone in any laboratory session. It is best to close it, except an emergency happens to befall you.
- All grades are periodically announced. Keep on checking regularly all your grades from Moodle page. Objections are to be considered only at office hours.
- The documents to be used in the lab will be published on Moodle.
- If you have any questions about the simulation and the report, you can send e-mails to the following addresses:
 - cansu.emir@atilim.edu.tr
 - duygu.tuna@atilim.edu.tr
 - onur.durhan@atilim.edu.tr
 - Dilek.demiroglu@atilim.edu.tr

Laboratory evaluation:

- 15 points for reports
- 5 points Quizzes