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| Faculty | Faculty of Engineering | | |
| Program | B.Sc. in Civil Engineering | Required | |
| | B.Sc. in Computer Engineering | Required | |
| | B.Sc. in Electrical-Electronics Engineering | Required | |
| | B.Sc. in Industrial Engineering | Required | |
| | B.Sc. in Mechanical Engineering | Required | |

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|---|---|-------------------|--------------------|-------------------|
| Course Code | PHYS 104 | | | |
| Course Title in English | Physics II | | | |
| Course Title in Turkish | Fizik II | | | |
| Language of Instruction | English | | | |
| Type of Course | Lecture | | | |
| Level of Course | Undergraduate Introductory | | | |
| Course Category (by % of Content) | Basic Science | Basic Engineering | Engineering Design | General Education |
| | 100% | - | - | - |
| Semester Offered | Fall | | | |
| Contact Hours per Week | Lecture: 3 hours | Recitation: - | Lab: - | Other: - |
| Estimated Student Workload | 151 hours | | | |
| Number of Credits | 6 ECTS | | | |
| Grading Mode | Standard Letter Grade | | | |
| Pre-requisites | None | | | |
| Expected Prior Knowledge | None | | | |
| Co-requisites | None | | | |
| Registration Restrictions | Only Undergraduate Students | | | |
| Overall Educational Objective | To acquire a knowledge in the basic principles of electromagnetism and fundamental laws of electricity and magnetism as well as the physics of electromagnetic waves and famous Maxwell's equations which are widely used in designing many machines and devices, with a perspective of using them in engineering applications. | | | |
| Course Description | This course discusses topics related to electromagnetism. The topics covered in this course are; electric charge and force, electric field; Gauss's law, electric potential, capacitance and dielectrics, current, resistance and electromotive forces, DC circuits, magnetic fields and forces, sources of magnetic field, electromagnetic induction, inductance and circuit oscillations, electromagnetic waves. | | | |
| Course Description in Turkish | Bu ders, elektromanyetizma ile ilgili konuları içermektedir. Derste işlenen konular: Elektrik yükü ve kuvveti; elektrik alanı; Gauss yasası; elektriksel potansiyel, kapasitans (sığa) ve dielektrikler, akım, direnç ve elektromotor kuvveti, DC devreleri, manyetik alan ve manyetik kuvvetleri, manyetik alan kaynakları, elektromanyetik indüksiyon, indüktans ve osilatör devreleri, elektromanyetik dalgalar. | | | |
| Course Learning Outcomes and Competences | Upon successful completion of the course, the learner is expected to: <ol style="list-style-type: none"> 1. comprehend the nature of the electric charge, evaluate the conservation laws related with electric charges and electric current; 2. demonstrate knowledge in the concept of electric potential energy; 3. comprehend the roles of circuit elements such as resistors, capacitors and inductors and the analysis of the circuits; 4. demonstrate knowledge in production mechanisms of magnetic force and fields through determining magnetic fields for some geometries; 5. demonstrate knowledge in magnetic induction, its effects and engineering applications; 6. demonstrate knowledge in the electromagnetic waves; 7. demonstrate ability to function as a team member. | | | |

| Relationship of the Course with the Student Outcomes | Level | Learning Outcome(s) | Assessed by |
|--|---|---|---|
| Student Outcomes | N=None S=Supportive H=High | | Exam, Project, HW, Experiment, Presentation, etc. |
| (1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics | H | 1-6 | Midterms, HW, Oral contributions, Quizzes |
| (2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors | | | |
| (3) an ability to communicate effectively with a range of audiences | | | |
| (4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts | | | |
| (5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives | S | 7 | Weakest link in HW and Quiz |
| (6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions | | | |
| (7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies | | | |
| Prepared by and Date | Prof. Dr. Ahmet Giz / January 2019 | | |
| Semester | Spring 2019-2020 | | |
| Name of Instructor | Prof. Ahmet Giz | | |
| Course Contents | Week | Topic | |
| | 1. | Electric charge and electric force | |
| | 2. | Electric field | |
| | 3. | Gauss's law | |
| | 4. | Electric potential | |
| | 5. | Capacitance and dielectrics | |
| | 6. | Energy in capacitors and electric fields | |
| | 7. | Current, resistance and electromotive force | |
| | 8. | Direct current circuits | |
| | 9. | Magnetic field and magnetic forces | |
| | 10. | Sources of magnetic field I | |
| | 11. | Sources of magnetic field II | |
| | 12. | Electromagnetic induction, magnetic energy | |
| | 13. | Inductance and circuit oscillations | |
| | 14. | Alternating Current | |
| | 15. | Final Exam/Project/Presentation Period | |
| | 16. | Final Exam/Project/Presentation Period | |
| Required/Recommended Readings | Textbook : Sears & Zemansky's University Physics, 14th Edition, Vol. 2 Mastering Physics with eText -- Access Card Package http://wps.aw.com/aw_young_physics_11/13/3510/898586.cw/index.html | | |
| Teaching Methods | Students should watch the lecture videos referred to in the blackboard system before they come to the classroom. The lectures are conventional lectures. However, contributions of students are welcome. The interaction with the students (Q&A) will be maximized as much as possible. | | |
| Homework and Projects | Weekly HW assigned through the Pearson System. | | |

| Laboratory Work | - | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|--|-----------|--------|-----------|---------|---|----|----------|-------|----|------|-------|----|-------|--|-----|----------------|--|--|---------------------|---|----|----------------|--|---|
| Computer Use | - | | | | | | | | | | | | | | | | | | | | | | | | |
| Other Activities | Weekly quizzes will take place. We will have 12 - 15 quizzes. Oral contributions (students solving example problems and describing their work on the whiteboard) for bonus credit. | | | | | | | | | | | | | | | | | | | | | | | | |
| Assessment Methods | <p>Types of assessment:</p> <table border="1"> <thead> <tr> <th></th> <th>Number</th> <th>Ratio (%)</th> </tr> </thead> <tbody> <tr> <td>Midterm</td> <td>3</td> <td>75</td> </tr> <tr> <td>Homework</td> <td>10-12</td> <td>15</td> </tr> <tr> <td>Quiz</td> <td>12-15</td> <td>10</td> </tr> <tr> <td>Total</td> <td></td> <td>100</td> </tr> <tr> <td colspan="3">Bonus Credits:</td> </tr> <tr> <td>Oral Contributions:</td> <td>2</td> <td>10</td> </tr> <tr> <td>Weakest Link*:</td> <td></td> <td>5</td> </tr> </tbody> </table> <ul style="list-style-type: none"> The students will be divided into groups of 4. Up to 5 points will be assigned to all group members depending on the quiz and HW performance of the weakest member of the group. This is to encourage team work among group members. | | Number | Ratio (%) | Midterm | 3 | 75 | Homework | 10-12 | 15 | Quiz | 12-15 | 10 | Total | | 100 | Bonus Credits: | | | Oral Contributions: | 2 | 10 | Weakest Link*: | | 5 |
| | Number | Ratio (%) | | | | | | | | | | | | | | | | | | | | | | | |
| Midterm | 3 | 75 | | | | | | | | | | | | | | | | | | | | | | | |
| Homework | 10-12 | 15 | | | | | | | | | | | | | | | | | | | | | | | |
| Quiz | 12-15 | 10 | | | | | | | | | | | | | | | | | | | | | | | |
| Total | | 100 | | | | | | | | | | | | | | | | | | | | | | | |
| Bonus Credits: | | | | | | | | | | | | | | | | | | | | | | | | | |
| Oral Contributions: | 2 | 10 | | | | | | | | | | | | | | | | | | | | | | | |
| Weakest Link*: | | 5 | | | | | | | | | | | | | | | | | | | | | | | |
| Course Administration | Students are expected to attend 70% of the classes. There is no make-up for missed classes. One make-up exam will be given at the end of the semester for those who miss an exam due to a legitimate excuse accepted by the instructor. The students are expected to pursue in this class with honesty and integrity. Disciplinary action will be pursued in all instances if academic dishonesty and cheating has occurred. Students with disabilities should consult the instructor for their special needs. For any question, please consult the instructor via mail (giza@mef.edu.tr). | | | | | | | | | | | | | | | | | | | | | | | | |

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| ECTS Student Workload Estimation | Activity | No/Weeks | Hours | | | Calculation | Explanation |
| | | No/Weeks per Semester (A) | Preparing for the Activity (B) | Spent in the Activity Itself (C) | Completing the Activity Requirements (D) | | |
| | Lectures | 14 | 1 | 3 | 1 | 70 | A*(B+C+D) |
| | Homework | 12 | | 3 | | 36 | A*(B+C+D) |
| | Quizzes | | | | | | |
| | Midterm(s) | 3 | 12 | 2 | 1 | 45 | A*(B+C+D) |
| | Final Examination | | | | | | A*(B+C+D) |
| | Total Workload | | | | | 151 | |
| | Total Workload/25 | | | | | 6.04 | |
| | ECTS | | | | | 6 | |