

## The Department of Mathematics

2022–23–B term

**Course Name** Electricity and Magnetism 1

**Course Number** 203.1.2371

**Course web page**

<https://www.math.bgu.ac.il/en/teaching/spring2023/courses/electricity-and-magnetism-1>

**Office Hours** <https://www.math.bgu.ac.il/en/teaching/hours>

### Abstract

### Requirements and grading<sup>1</sup>

### Course topics

Vector analysis. electric field (including Coulomb law, Gauss law, and first Maxwell equation). Electric potential (including Laplace and Poisson equations, electric dipole). Conductors (including capacity and capacitors). Electric current (including Ohm's law, direct current circuits, RC circuit). Magnetic field I (including special relativity connections, Lorentz force, Ampere force, magnetic moment). Magnetic field II (including vector potential, Bio-Savard's law, Ampere's law, absence of magnetic charge, second Maxwell equation, truncated third Maxwell equation, gauge, field of magnetic moment, solenoids). Electromagnetic induction (including fourth Maxwell equation, Lenz law, inductance, AC current circuits). Maxwell equations and electromagnetic waves. (Optional) Electric and magnetic properties of materials

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<sup>1</sup>Information may change during the first two weeks of the term. Please consult the webpage for updates