

8.02 ESG Independent Study

Unit 7: Current and Resistance

Up to now, we've been dealing primarily with electrostatics, considering only stationary charge configurations. However, we know from previous units that charges on a conductor "rearrange" themselves. The motion of charges corresponds to a current. This unit examines the relation between current, the flow of charge, and voltage, the potential between parts of a conductor which is not at equilibrium.

Objectives: After completing this unit, you should be able to relate the following concepts and terms both qualitatively and quantitatively, and use them to answer questions involving flow of electric charges: charge density, current density, resistivity, electric field, current, resistance, voltage.

Suggested Procedure:

1. Read sections 25.1 through 25.3 and 25.6 in UP11. Sections 25.4 and 25.5 can be saved for Unit 8. Suggested problems are 8, 14, 28, 60, 67, 81. Or,
2. Read chapter 4 in Purcell, sections 1–8 (section 7 will not be needed until the next unit). Suggested problems include pp. 162–163, #s 4, 5, 8, 10, 11.
3. Take a unit test.