

ECE 656: Week 7 References

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Ashcroft and Mermin present a good discussion of the Hall effect and magnetoresistance.

N.W. Ashcroft and N.D. Mermin, *Solid State Physics*, Saunders College, Philadelphia, 1976. The simple Drude model is discussed on pp. 11-15 and p. 58.

Davies presents clear discussions of the classical Hall effect, as well as Landau levels, the Shubnikov-de Haas effect, and the quantum Hall effect.

J.H. Davies, *The Physics of Low-Dimensional Semiconductors*, Cambridge Univ. Press, Cambridge, UK, 1998.

Conductivity and resistivity tensor:	pp. 216-219
Landau levels:	pp. 223-227
Shubnikov-de Haas effect:	pp. 227-228
Integer quantum Hall effect:	pp. 228-232

Another good treatment of magneto-transport can be found in Chapter 10 of the text below. Chapters 13 and 14 discuss quantum effects.

Mildred Dresselhaus, Gene Dresselhaus, Stephen B. Cronin, and Antonio Gomes Souza Filho, *Solid State Properties: From Bulk to Nano*, Springer-Verlag, Berlin, 2018.

The following review paper presents an excellent discussion of the quantum Hall and related effects.

D. F. Holcomb, "Quantum electrical transport in samples of limited dimensions," *American Journal of Physics*, **67**, pp. 278-297, April 1999.

The following two books provide good discussion of transport in high magnetic fields including the Shubnikov-de Haas effect and the Quantum Hall Effect.

Supriyo Datta, *Electronic Transport in Mesoscopic Systems*, Cambridge Univ. Press, Cambridge, U.K., 1995. (see Chapter 4)

J. Singh, *The Physics of Semiconductors and Their Heterostructures*, McGraw Hill, New York, 1993.

