ECE 656: Week 1 References

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For a review of semiconductor fundamentals, see:

> R. F. Pierret, *Advanced Semiconductor Fundamentals*, 2nd Ed., Pearson Education, Inc., Upper Saddle River, New Jersey, 2003.

For a discussion of band structure, phonons and phonon dispersions, Brillouin zones, etc., consult a solid-state physics textbook such as:

> N.W. Ashcroft and N.D. Mermin, *Solid State Physics*, Saunders College, Philadelphia, 1976.

The classic treatment of electrons and phonons in solids is the text by Ziman.

> J.M. Ziman, *Electrons and Phonons*, Clarendon Press, Oxford, U.K. 1960.

For a clear, succinct treatment of electron and phonon dispersions, see:

> Walter A. Harrison, *Solid State Theory*, Dover, NY, 1979.

For a good, thorough introduction to energy band theory, see Chapters 1-4 in the text below. For an introduction to phonons, see Chapter 6, and for a treatment of semiclassical electron dynamics see Chapter 5. Quantum wells and superlattices are discussed in Chapter 12.

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

A list of band gaps, effective masses, and related parameters for several semiconductors are listed in Table 2.1, page 56 of:

> Lino Reggiani, "General Theory," Chapter 2 *in Hot Electron Transport in Semiconductors*, vol. 58 of *Topics in Applied Physics*, Springer-Verlag, New York, 1985.

The treatment of warped energy bands (e.g. the valence bands of common semiconductors) is described in this paper.

> Nicholas A. Mecholsky, Lorenzo Resca, and Ian L. Pegg, "Theory of band warping and its effects on thermoelectronic transport properties," *Physical Review B*, vol. 89, 155131, 2014