

Course Text: R.K. Pathria and P.D. Beale, *Statistical Mechanics*, 3rd ed., Academic Press, 2011; pb [978-0123821881].

Strongly Recommended:

Mehran Kardar, *Statistical Physics of Particles*, Cambridge, 2007 [978-0521873420]. The lecture notes on which the book is based can be downloaded free from <http://ocw.mit.edu/courses/physics/8-333-statistical-mechanics-i-statistical-mechanics-of-particles-fall-2007/index.htm>

Donald A. McQuarrie, *Statistical Mechanics*, Univ. Science Books, 2000 [1891389157], esp. for chemists.

James P. Sethna, *Statistical Mechanics: Entropy, Order Parameters and Complexity*, Oxford, 2006; pb [978-0198566779].
pages.physics.cornell.edu/sethna/StatMech/EntropyOrderParametersComplexity.pdf

David Chandler, *Introduction to Modern Statistical Mechanics*, Oxford, 1987; pb [0195042778].

A.M. Guenault, *Statistical Physics*, 2nd ed., Springer, 2007; pb [978-1-4020-5974-2]

Lukong C. Fai and Gary M. Wysin, *Statistical Thermodynamics: Understanding the Properties of Macroscopic Systems*, CRC Press, 2013 [978-1-4665-1067-8].

Other Statistical Physics Texts:

Kerson Huang, *Statistical Mechanics*, 2nd ed., Wiley, 1987 pb [0471815187].

Silvio Salinas, *Introduction to Statistical Physics*, Springer, 2010 bp [978-1441928849], seemingly pb version of 2001 hardback

D.C. Mattis and R.H. Swendsen, *Statistical Mechanics Made Simple* (2nd ed.), World Scientific, 2008 [978-9812779083].

J.D. Walecka, *Introduction to Statistical Mechanics*, World Scientific, 2011 pb [978-9814366218]

J.D. Walecka, *Fundamentals of Statistical Mechanics: Manuscripts and Notes of Felix Bloch*, World Scientific, 2001 pb [978-9810244194]

D. Yoshioka, *Statistical Physics: An Introduction*, (Springer, 2005)

L.D. Landau, M.J. Kearsley, E.M. Lifshitz, *Statistical Physics: Part 1*, 3rd ed., Butterworth-Heinemann, 1980; pb [0750633727]; *Part 2*, Butterworth-Heinemann, 1995 [0750626384].

Shang-Keng Ma, *Statistical Mechanics*, World Scientific, 1985; pb [9971966077].

D. Goodstein, *States of Matter*, Dover reprint, 2002; pb [978-0486495064].

Brian Cowan, *Topics in Statistical Mechanics*, World Scientific, 2005; pb [978-1860945694].

G.H. Wannier, *Statistical Physics*, Dover, 2010 [reprint of classic text, seemingly out of print]; pb [978-0486654010]

E. Schrödinger, *Statistical Thermodynamics*, Cambridge, 1964, Dover, 1989; pb [978-0486661018].

P.M. Morse, *Thermal Physics*, 2nd ed., 1969; [978-0805372021]

Thermodynamics Texts:

Herbert B. Callen, *Thermodynamics*, Wiley, 1960; *Thermodynamics and an Introduction to Thermostatistics*, Wiley, 1985 [978-0471862567].

E. Fermi, *Thermodynamics*, 1936, Dover, 1956; pb [486-60361-X]

A.B. Pippard, *Classical Thermodynamics*, 1957; for a more readable exposition, see C.J. Adkins (Pippard's student), *Equilibrium Thermodynamics*, 3rd ed., Cambridge, 1984; pb [978-0521274567]

Numerical Techniques:

H. Gould, J. Tobochnik, and Wolfgang Christian, *An Introduction to Computer Simulation Methods: Applications to Physical Systems*, 3rd ed., Addison-Wesley, 2006; pb [978-0805377583].

Dieter W. Heermann, *Computer Simulation Methods in Theoretical Physics*, 2nd ed., Springer, 1990; pb [0387522107].

K. Binder and D.W. Heermann, *Monte Carlo Simulation in Statistical Physics: An Introduction*, 3rd ed., Springer, 1997; pb [3540632654].

M.E.J. Newman and G.T. Barkema, *Monte Carlo Methods in Statistical Mechanics*, Oxford, 1999; pb [0198517971].

D.C. Rapaport, *The Art of Molecular Dynamics Simulation*, Cambridge, 1997; pb [0521599423].

J.M. Thijssen, *Computational Physics*, Cambridge, 1999; pb [052157588]: lots of physics, presented in a format useful for computations, but over 1/3 on electronic aspects.

D. Frenkel and B. Smit, *Understanding Molecular Simulation*, 2nd ed: From Algorithms to Applications, Academic, 2001 [978-0122672511].

Less-Advanced Texts:

B. Widom: *Statistical Mechanics: A Concise Introduction for Chemists*, Cambridge U Press, 2002; pb [978-0521811194];

W. Greiner and L. Neise, *Thermodynamics and Statistical Mechanics*, Springer, 1995; pb [0387942998].

Undergraduate Texts:

S.G. & K.M. Blundell, *Concepts in Thermal Physics* (Oxford U. Press, 2006, reprinted 2007 with corrections) [978-0-19-856770-7]

Harvey Gould and Jan Tobochnik, *Thermal and Statistical Physics: With Computer Applications*, Princeton U

Press, 2010 [978-0691137445]
<http://stp.clarku.edu/notes/>

Daniel V. Schroeder, Thermal Physics, Addison Wesley Longman, 2000 [0-201-38027-7]

Ralph Baierlein, Thermal Physics, Cambridge University Press, 2000; pb [0-521-65838-1]

F. Mandl, Statistical Physics, 2nd ed., Wiley, 1988; pb [978-0471915331]

M. D. Sturge, Statistical and Thermal Physics, A K Peters, 2003 [156881196-1], lots of typos

C. Kittel and H. Kroemer, Thermal Physics, 2nd ed., Freeman, San Francisco, 1980 [0-7167-1088-9], unpopular but often used as PHYS404 course text.

C. Garrod, Statistical Mechanics and Thermodynamics, Oxford, 1995 [019508523X].

Don S. Lemons, Mere Thermodynamics, Johns Hopkins University Press, 2009; pb [0-8018-9015-2]

Richard L. Rowley, Statistical Mechanics for Thermophysical Property Calculations, Prentice-Hall, 1994 [0130308188].

F. Reif, Fundamentals of Statistical and Thermal Physics, Waveland Press, 2008 [978-1577666127].

More-Advanced Texts (most from Phys. 704):

Mehran Kardar, Statistical Physics of Fields, Cambridge, 2007 [978-0-521-87341-3].

P. Krapivsky, S. Redner and E. Ben-Naim, A Kinetic View of Statistical Physics, Cambridge, 2010 [978-0-521-85103-9]

M. Plischke and B. Bergerson, Equilibrium Statistical Physics, 3rd ed., World Scientific, 2006; pb [9812561552]

Paul M. Chaikin and T. C. Lubensky, Principles of [[Soft !!]] Condensed Matter Physics, Cambridge, 2000; pb [0521794501], used as text in 2002.

L. P. Kadanoff, Statistical Physics: Statics, Dynamics and Renormalization, World Scientific, 2000; pb [9810237642].

Michel Le Bellac, Fabrice Mortessagne, and G. George Batrouni, Equilibrium and Non-Equilibrium Statistical Thermodynamics, Cambridge, 2004; [0521821436]; used as text in 2006.

Linda E. Reichl, A Modern Course in Statistical Physics, 3rd ed., Wiley 2009 pb [3527407820]; 2nd ed., Wiley, 1998 [0471595209].

N.G. van Kampen, Stochastic Processes in Physics and Chemistry, 3rd ed., North Holland, 200-7; pb [978-0444529657].

Outstanding series: Phase Transitions and Critical Phenomena, C. Domb and J.L. Lebowitz (formerly M.S. Green), Academic; no longer pub.

Other Noteworthy Advanced Texts:

Radu Balescu, Equilibrium and Nonequilibrium Statistical Mechanics, Wiley, 1975; out of print [0471046000]; esp. chap. 11 on non-equilibrium.

J.R. Dorfman, An Introduction to Chaos in Nonequilibrium Statistical Mechanics, Cambridge, 1999; pb [0521655897].

R.P. Feynman, Statistical Mechanics, W.A. Benjamin, 1972; pb [0805325093].

C.W. Gardiner, Handbook of Stochastic Methods, 2nd ed., Springer, 1985, pb [3540616349].

R. Kubo, M. Toda, and N. Hashitsume, Statistical Physics II: Nonequilibrium Statistical Mechanics, 2nd ed., Springer, 1991; pb [038753833X].

G. F. Mazenko, Equilibrium Statistical Mechanics, Wiley, 2000 [0471328391].

G. F. Mazenko, Fluctuations, Order, and Defects, Wiley, 2002 [978-0471328407].

G. F. Mazenko, Nonquilibrium Statistical Mechanics, Wiley, 2006 bp [978-3527406487].

H. Eugene Stanley, Introduction to Phase Transitions and Critical Phenomena, Oxford, 1971, 1997; pb [0195053168].

J.M. Yeomans, Statistical Mechanics of Phase Transitions, Oxford, 1992; pb [0198517300].

Advanced Specialized Texts:

Radu Balescu, Statistical Dynamics: Matter out of Equilibrium, Imperial College Press, 1997; pb [1860940463] unavailable; [1860940455].

R.J. Baxter, Exactly Solved Models in Statistical Mechanics, Academic, 1982 [0120831805].

John Cardy, Scaling and Renormalization in Statistical Physics, Cambridge, 1996; pb [0521499593].

S.R. Degroot, P. Mazur, and S.R. De Groot, Non-Equilibrium Thermodynamics, Dover, 1984; pb [0486647412].

M.E. Fisher, in Critical Phenomena, H. Araki et al., eds., Springer, 1983 [0387126759].

Nigel Goldenfeld, Lectures on Phase Transitions and the Renormalization Group, Addison-Wesley, 1992; pb [0201554097].

P. Pfeuty and G. Toulouse, Introduction to the Renormalization Group and to Critical Phenomena, Wiley, 1977.

J.P. Hansen and I.R. McDonald, Theory of Simple Liquids, 3rd ed., Academic, 2006 [978-0123705358].

Extensive compilation of texts, inc. most of the above:

<http://stp.clarku.edu/books/#grad/>; see also a commented list at <http://crab.rutgers.edu/~cowley/thermal1/textbooks.htm>

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