PHYS 4031 Statistical Mechanics (2016-17 Term 1)
FURTHER READING

The following books start from where we are in PHYS4031 and take you further.

Closer to PHYS4031:
([R] = available at the reserved books sections in University Library)

D. Yoshioka, *Statistical Physics: An Introduction* (Springer 2007) [Ebook available. We covered all topics. It is an excellent book for learning the key ideas in statistical mechanics.]

[R] Harald J. W. Muller-Kirsten, *Basics of Statistical Physics – A Bachelor Degree Introduction*, World Scientific 2010. [We did all the topics. The book has many worked examples. If you like to solve more problems or just to see other people solving problems, this is a good place.]

W. Greiner, L. Neise, and H. Stocker, *Thermodynamics and Statistical Mechanics* (Springer). [We did nearly all the topics in the Stat Mech part. In this book, the discussions are thorough and there are many worked examples. It is a place for more examples/problems.]

C. Hermann, *Statistical Physics* (Springer 2005) [Ebook available. We did most topics. The book discusses more applications to solid state systems.]

[R] C. Kittel and H. Kroemer, *Thermal physics,* 2nd ed. WH Freeman. [QC311.5 .K52 1980] [We did most topics in this classic. If you want to see how stat mech and thermodynamics put together, it is a good place.]

S.J. Blundell and K.M. Blundell, *Concepts in Thermal Physics* (Oxford Univ. Press 2006) [QC 254.2.B58 2006] [We did most topics on the statistical physics materials. It gives you all you need to know about thermodynamics and statistical mechanics at the undergraduate level and slightly beyond. Topics are presented with clarity.]

汪志诚 热力学. 统计物理 （第三版）高等教育出版社 (2002) [A standard undergraduate textbook in Mainland.]

Go to the graduate level
[R] D. Chandler, *Introduction to Modern Statistical Mechanics*, Oxford University Press. [QC174,8 C47] [We did the first 4 chapters. It is a short beginning graduate level textbook. There are two good chapters on theory of phase transitions and the

applications of Monte Carlo simulations.]

R.K. Pathria, *Statistical Mechanics* (2nd edition) (Oxford Univ. Press 1996) (or later edition by Pathria and Beale. [This is a standard graduate level statistical mechanics book, and it is a good book for undergraduates who will be going to graduate schools. We covered most of the first 8 chapters (about first 40% of the book).]

M. Plischke and B. Bergersen, *Equilibrium Statistical Mechanics* (World Scientific 2006 and later editions). [This book covers more topics with less detail as in Pathria. It is a popular graduate level textbook.]

D. McQuarrie, *Statistical Mechanics* (University Science Books 2000) [We did about half the book. The second half is more on applications and needs more mathematics. It is nicely written with a strong physical chemistry flavor.]

M. Kardar, *Statistical Physics of Particles* and *Statistical Physics of Fields* [2 books in a series] (Cambridge Univ. Press) [Part I is similar to our coverage, but we used a simpler language. The books reflect the courses at MIT on the subject. There is a paperback mainland edition.]

[R] K. Huang, *Statistical Mechanics* [QC175.8.H8 1987]. The first edition was published in 1963. [This is a classic that gives a rigorous treatment on statistical mechanics at the beginning graduate level.]

[R] M. Gitterman and V. Halpern, Phase transitions: A brief account with modern applications, World Scientific (2004). [QC175.16.P5 G57 2004] [We introduced phase transitions and critical phenomena. This short 130-page book takes you further and discusses applications.]

J.V. Selinger, Introduction to the Theory of Soft Matter − From ideal gases to liquid crystals, Springer (2016). [This new book is a good illustration of the wide applications of statistical mechanics. For students interested in soft matter physics, it so happens that we did 4 chapters out of this 10-chapter book. Ebook available.]

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