

Course timetable and reading materials for PHYS3020, Sem 2, 2018

Week 1		
Tue	24 Jul	Lecture 1: Introduction; An overview of Thermal Physics. [Schroeder, pp. 1-20].
Wed	25 Jul	L2: Multiplicity; States of model binary systems. [Schroeder, pp. 49-66, 68-74] or [Kittel, pp. 5-26].
Thu	26 Jul	Problem Set 1 (due by Mon 30 Jul, 3:00pm). Reading Quiz 1 due by the start of the tutorial.
Week 2		
Tue	31 Jul	L3: Micro-canonical ensemble; Fundamental assumption. [Schroeder, pp. 56-59, 74-94] or [Kittel, pp. 29-45].
Wed	1 Aug	L4: Entropy; Temperature. [Schroeder, pp. 74-94, 98-105] or [Kittel, pp. 29-45]. Reading Quiz 2 due by the start of the lecture.
Thu	2 Aug	Problem Set 2 (due by Fri 3 Aug, 3:00pm).
Week 3		
Tue	7 Aug	L5: Laws of thermodynamics. [Kittel, pp. 45-52] or [Schroeder 17-20, 74-98].
Wed	8 Aug	L6: Canonical ensemble formalism: Boltzmann Factor; Partition Function. [Schroeder, pp. 220-229] or [Kittel, pp. 58-64]. Reading Quiz 3 due by the start of the lecture.
Thu	9 Aug	Revision of problems for Weeks 1-3; Start Problem Set 3 (due next week).
Week 4		
Tue	14 Aug	L7: Canonical ensemble formalism: Free energy, Pressure, & Thermodynamic Identity. [Schroeder, pp. 108-114, 149-152, 156-164] or [Kittel, pp. 64-72].
Wed	15 Aug	Public Holiday (Reading Quiz 4 due on Thu)
Thu	16 Aug	Problem Set 3 (due by Fri 17 Aug, 3:00pm). Reading Quiz 4 due by the start of the tutorial.
Week 5		
Tue	21 Aug	L8: Ideal gas: a first look; Gibbs Paradox; Equipartition Theorem. [Schroeder, pp. 229-255] or [Kittel, pp. 72-81].
Wed	22 Aug	L8 (cont.): Ideal gas: a first look; Gibbs Paradox; Equipartition Theorem. [Schroeder, pp. 229-255] or [Kittel, pp. 72-81]. Reading Quiz 5 due by the start of the lecture.
Thu	23 Aug	Problem Set 4 (due by Fri 24 Aug, 3:00pm).
Week 6		
Tue	28 Aug	Extra-curriculum lecture on Negative Temperature. [Schroeder, 100-103] or [Kittel, pp. 460-463].
Wed	29 Aug	Revision. No reading quiz or problem sets this week.
Thu	30 Aug	Mid Semester Test 1
Week 7		
Tue	4 Sep	L9: Grand-canonical ensemble formalism: Chemical potential; Grand-Canonical Partition Function. [Schroeder, pp. 115-121, 257-261] or [Kittel, pp. 117-122, 131-140].
Wed	5 Sep	L10: Identity of particles in Quantum Mechanics; Bosons and Fermions;

		Bose-Einstein and Fermi-Dirac distributions. [Schroeder, pp. 262-271,379-380] or [Kittel, pp. 151-161]. Reading Quiz 6 due by the start of the lecture.
Thu	6 Sep	Problem Set 5 (due by Mon 10 Sep, 12:00noon).
Week 8		
Tue	11 Sep	L11: Quantum and classical regimes of an ideal gas; Grand canonical description of the ideal gas. [Schroeder, pp. 262-271,379-380] and [Kittel, pp. 160-166].
Wed	12 Sep	L12: Spin multiplicity; Quantum states and quantum density of states. [Schroeder, pp. 262-271,279-282] or [Kittel, pp. 181-188]. Reading Quiz 7 due by the start of the lecture.
Thu	13 Sep	Problem Set 6 (due by Mon 17 Sep, 12:00noon).
Week 9		
Tue	18 Sep	L13: Fermi gases. [Schroeder, pp.271-282] or [Kittel, pp. 183-189].
Wed	19 Sep	L14: Finite temperature Fermi gases. [Schroeder, pp.282-288] or [Kittel, pp. 189-199]. Reading Quiz 8 due by the start of the lecture.
Thu	20 Sep	Problem Set 7 (due by Tue 2 Oct, 12:00noon).
MID-SEMESTER BREAK		
Week 10		
Tue	2 Oct	L15: Bose gases. [Schroeder, pp.315-326] or [Kittel, pp. 199-206].
Wed	3 Oct	L16: Finite temperature Bose gases. [Schroeder, pp.315-326] or [Kittel, pp. 202-210]. Reading Quiz 9 due by the start of the lecture.
Thu	4 Oct	Problem Set 8 (due by Mon 8 Oct, 12:00noon).
Week 11		
Tue	9 Oct	Revision.
Wed	10 Oct	Mid-Semester Test 2 No reading quiz this week.
Thu	11 Oct	Solutions to <i>Mid-Semester Test 2</i>
Week 12		
Tue	16 Oct	L17: Black-body radiation, Part I: Planck distribution. [Schroeder, pp.288-292] or [Kittel, pp. 89-94].
Wed	17 Oct	L18: Black-body radiation, Part II: Planck radiation law. [Schroeder, pp. 292-306] or [Kittel, pp. 94-98]. Reading Quiz 10 due by the start of the lecture.
Thu	18 Oct	Problem Set 9 (due by Mon 22 Oct, 12:00noon).
Week 13		
Tue	23 Oct	L19: Debye model of a solid. [Schroeder, pp. 307-314] and [Kittel, pp. 102-110].
Wed	24 Oct	L20: The Ising model of a ferromagnet. [Schroeder, pp. 339-346]. Reading Quiz 11 due by the start of the lecture.
Thu	25 Oct	Problem Set 10 (due by Fri 26 Oct, 5:00pm).
3 Nov – 17 Nov: Examination period		