Week	Book section	Topic
1	**1**	**The Methodology of Statistical Mechanics**
1	**1.1**	**Terminology and Methodology**
1	1.1.1	Approaches to the subject
1	1.1.2	Description of states
1	1.1.3	Extensivity and the Thermodynamic Limit
1	**1.2**	**The Fundamental Principles**
1	1.2.1	The Laws of Thermodynamics
1	1.2.2	Probabilistic interpretation of the First Law
1	1.2.3	Microscopic Basis for Entropy
1	**1.3**	**Interactions – The Conditions for Equilibrium**
1	1.3.1	Thermal Interaction – Temperature
1	1.3.2	Volume change – Pressure
1	1.3.3	Particle interchange – chemical potential
1	1.3.4	Thermal interaction with the rest of the world – the Boltzmannfactor
1	1.3.5	Particle and energy exchange with the rest of the world – the Gibbsfactor
1	**1.4**	**Thermodynamic Averages**
1	1.4.1	The Partition Function
1	1.4.2	Gibbs Expression for Entropy
1	1.4.3	Free Energy
1	1.4.4	Thermodynamic Variables
2	1.4.5	The beta trick
8	1.4.6	Fluctuations
	1.4.7	The Grand Partition Function
	1.4.8	The Grand Potential
	1.4.9	Thermodynamic variables
	1.5	**Quantum Distributions**
	1.5.1	Bosons and Fermions
	1.5.2	Grand Potential for Identical Particles
	1.5.3	The Fermi-Dirac Distribution
	1.5.4	The Bose-Einstein Distribution
	1.5.5	The Classical Limit – The Maxwell-Boltzmann Distribution
2	**1.6**	**Classical Statistical Mechanics**
2	1.6.1	Phase Space and Classical States
2	1.6.2	Boltzmann and Gibbs Phase Spaces
2	1.6.3	The Fundamental Postulate in the Classical Case
2	1.6.4	The classical partition function
2	1.6.5	The equipartition theorem
2	1.6.6	Consequences of equipartition
2	1.6.7	Liouville'stheorem
2	1.6.8	Boltzmann's H theorem
	1.7	**The Third Lawof thermodynamics**
	1.7.1	History of the Third Law
	1.7.2	Entropy
	1.7.3	Quantum viewpoint
	1.7.4	Unattainability of absolute zero
	1.7.5	Heatcapacity at low temperatures
	1.7.6	Other consequences of the Third Law
	1.7.7	Pessimist's statement of the laws of thermodynamics
2	**2**	**Practical Calculations with Ideal Systems**
10	**2.1**	**The Density of States**
10	2.1.1	Non-interacting systems
10	2.1.2	Converting sums to integrals
10	2.1.3	Enumeration of states