Chapter 17

Read chapter 17.1, think about processes in nature (e.g. oceans, icebergs, and water currents) and technology (e.g. car motors); decide whether they are in thermal equilibrium and whether one can assign a temperature to them as a whole.

Take note of eqn 17.1, 17.2, 17.3

Study figure 17.5 with text on page 556.

Study the connection between figures 17.8 and 17.9.

Study Chapter 17.5 with examples. Connect eqn 17.20 and the numerical values for Lf and Lv given above and below with fig. 17.21.

Work example 17.8. This is a key concept. If you have trouble understanding it, use SI and TA help until you are comfortable with it.

Understand when to apply eqn 17.21 and 17.25, then tackle the difference between eqn 17.25 and 17.26.

Chapter 18

Read chapter 18.1 make sure you understand what exactly an equation of state is and how it depends on the model you are using; understand what exactly the ideal gas law states about the state variables. Take note of eqn 18.2, make sure you understand the difference between m and M.

Understand how one puts eqn 18.3 to use by turning it into eqn 18.6. Take note how 18.6 is a new conservation law and recall how energy conservation etc. helped us to write down statements, which must be true. Work through the examples, which follow and recognize how we use eqn 18.6 in a more variable way than, for example, energy conservation.

Work example 18.4. Make sure you understand the mathematical steps, which are skipped.

Compare eqn 18.7 with 18.3. Check how 18.7 reduces to 18.3 in the limit of low density (you need to factor a part of the left hand side of 18.7 to see it clearly).

Now study fig 18.6 and 18.7 with eqn 18.3 and 18.7. Make sure you understand that the main effect is to make phase transitions from liquid to gas possible. Explain to a friend what happens in fig. 18.7 to a gas that is liquefied at constant temperature in terms of pressure and volume. Connect that explicitly to what you know about density, pressure, and volume of liquids versus that of gases.

Read and study the derivation of the basic facts of kinetic gas theory in chapter 18.3. explain to a friend what the great gain of eqn 18.14 is (exactly how does it connect the new world of thermal physics to the better known world of mechanics?).

Chapter 19

Read the lecture slides – my lecture goes deeper than the text book.

Read chapter 19.2. Study figure 19.6 and example 19.2

Read chapter 19.4. Study example 19.4.

Read chapter 19.5 and 19.7.

Read chapter 19.8. Understand where eqn 19.21 and 19.23 are coming from and compare with figure 19.20 to see how the two eqn determine the curvature of the adiabat curve.

Chapter 20

Read chapter 20.1.

Understand in chapter 20.2 what a hot and cold reservoir is and why they are needed. Study figure 20.3.

Read chapter 20.5 and 20.6. Understand why eqn 20.14 holds true. Work example 20.3.

Read chapter 20.7. Compare example 20.5 with example 20.6.

Compare entropy in reversible and cyclical processes with each other.

Read chapter 20.8. Study figure 20.21.

Chapter 21

Study fig. 21.1, 6, 7

Work example 21.4, make sure you understand the reason for the use of trig functions

Read Sub-chapter 21.4, work example 21.6, make sure you understand how signs are determined in field calculations

Work 21.9, 10

Read sub-chapter 21.6

Chapter 22

Read sub-chapter 22.2, 3

Work example 22.5, 6, 7, 9

Chapter 23

Read sub-chapter 23.1, study figure 23.7, work example 23.1

Read sub-chapter 23.2, work examples 23.4, 7, 8 – make sure you understand why V is not zero inside the sphere (exp 23.8)

Work example 23.10, 11

Study figure 23.23, 24, 25

Chapter 24

Read sub-chapter 24.1, make sure you understand the derivation of equation 24.2, refer back to chapter 22 where it is made use of in the derivation

Take note of the main results of example 24.3, 24.4 (independence of r and why that is so)

Work through sub-chapter 24.2

Re-work until you know the origin of the parallel and series network rules by heart.

Work through example 24.6 go back to the chapter on series and parallel rules, if you get confused about any aspect of the example; if still confused, see me during office hours – it is important to address this asap

Read sub-chapter 24.3 and sub-chapter 24.6, make sure you understand how the energy equation is derived.

Read the sub-sub-chapter ‘Induced Charge and Polarization’ in ch. 24.4; test yourself whether you can make predictions for all common electrical quantities when a dielectric is inserted

Work at least two network examples, which have answers printed at the end of the book. Do not stop until you get the numbers right and review explicitly what you did wrong at first.

Chapter 25

Read sub-sub-chapter ‘Current, Drift Velocity …’ in sub-chapter 25.1, make sure you understand the derivation of eqn 25.2

Read sub-chapter 25.2 and 25.3

Study figure 25.11, table 25.4, and work example 25.5, 6

Study figure 25.20

Read sub-chapter 25.5

**Chapter 26**

Work through sub-chapter 26.1

Re-work until you know the origin of the parallel and series resistor network rules by heart. Go back to chapter 24 and take note of the difference in network rules. Explain out loud to yourself (or to a friend0 why the rules are different (use the water analogy of electricity, if it helps)

Work example 26.1 go back to the chapter on series and parallel rules, if you get confused about any aspect of the example; if still confused, see me during office hours – it is important to address this asap

Read Problem-Solving-Strategy 26.2, work through example 26.4, 6

Read chapter 26.3, next time in lab double check you completely understand how to apply it in practice. Ask, if you are the least bit uncertain.

Read chapter 26.4, study closely figures 26.20, 21, 22, 23. Interpret the meaning of the exponential curves out loud: more less current/ charge as time goes on during charging/discharging a capacitor.

Safety note: Understand what it means for potential electric shocks that capacitors take a certain time to discharge ‘mostly’.

**Chapter 27**

Read chapter 27.2 focus on understanding figure 27.6/7 and example 27.1

Read chapter 27.3 make sure you understand equation 27.6

Study figure 27.17 + 27.18

Read chapter 27.6 study figure 27.27 and get comfortable with applying he right hand rule

Make sure you understand what equation 27.19 states and how it is derived

Work through example 27.8

Study figure 27.31, make sure you understand what a magnetic dipole and magnetic dipole moment are

Then study equations 27. 26 and equation 27.27 together with figure 27.34: answer the question ‘how does the motion that will result in the figure come from the two equations?’)

Read sub-chapter (identified by a headline) ‘Magnetic Dipole in a Nonuniform magnetic Field’ and study figures 27.36 and 27.37.

Read chapter 27.9 and use it for your lab analysis.

Review discussion question Q27.12 (before the exercises chapter at the end of chapter)

Chapter 28

Read Chapter 28.1, study to connect eqn 28.2 with fig. 28.1 and fig. 28.2/example 28.1

Study eqn 28.6 and relate it back to eqn 28.2

Read ch. 28.3

Make sure you understand the geometry of fig 28.5 and the derivation of eqn 28.9

Work through exp 28.4, focus on understanding the field directions, the integral, and the building of the limits in the ‘evaluate’ section of the example.

Eqn. 28.11 and fig. 28.9

Fig. 28.12

Ch. 28.6, focus on fig. 28.16 and work through the case of no current included (page 936)

Chapter 29

Read ch. 29.1

Read ch. 29.2 and study fig. 29.6, make sure you understand the captions of each picture in the figure

Work exp. 29.5

Read ch. 29.3, study fig. 29.8, compare fig. 29.8 with fig. 29.6

Read ch. 29.4

Chapter 30

Study fig. 30.1 with eqn 30.4, connect eqn 30.4 with the text on p. 992 that leads up to the eqn

Read ch. 30.2, study fig. 30.6, make sure you understand why and how a potential difference exists across a coil

Study p. 1002/1003/1004

Study eqn 30.20+30.22 + table 30.1

Study fig. 30.16+30.17

Chapter 31

Chapter 32