

Review Material for Exam #2

This exam will contain fewer multiple choice/fill in the blank type questions. The goal of this exam is to assess your ability to understand and describe some of the basic concepts and then apply those concepts in the context of interpretation of figures from the notes and text and simple problems. You will be able to use a calculator during the exam, although the amount of actual use of the calculator will be small.

Core material to review

- 1) The presumption is that you have gained a basic familiarity with typical values of pressure and elevation for the Salt Lake Valley, nearby mountains, etc.
- 2) There is overlap with material presented in the first part of the course (Lecture 5.1, for example), particularly dealing with stability, hydrostatic environment, use of skew-T diagram, etc.
- 3) Lectures 6.1 & 6.2. Incoming solar radiation, concept of seasons, zenith angle (no, you do not need to memorize the formulas for zenith angle), why greater solar radiation on top of high mountain when sun low on horizon compared to sea level, impact of terrain slope on incoming solar radiation, components of global energy budget, Stefan Boltzman law, net surface radiation budget (text figure 4.8), surface energy balance (text figure 4.9 and 4.10)
- 4) Lecture 7.1. Role of buoyant thermals in sport aviation, sources of good thermals, reading assignments on thermals, in class exercise #6 on estimating buoyant lift
- 5) Lecture 8.1 and 9.3. Terrain-forced circulations. Kinetic energy vs. potential energy. What causes air to go over vs. around obstacles. Froude number. Dividing streamline. Gap flows, blocked flows, flow over terrain. Downslope wind storms. Review material in COMET modules.
- 6) Lecture 10.1. Thermally driven flows. What is the purpose of the METCRAX field program? What causes thermally driven flows? Slope flows vs. valley flows vs. mountain/plain flows vs. lake breeze.