

**MET 101: Meteorology**  
**LAB MIDTERM REVIEW SHEET**

**LAB MIDTERM:**

You are responsible for all of the material that was covered during labs 1-6. Any other labs such as Air Masses/Stationary Fronts or the Warm and Cold Fronts lab, which may have been covered before the lab midterm, will be tested on the lab final exam. The lab midterm will cover each of the labs listed below. Under each lab title below is a listing of the concepts, ideas, plots, isopleth's or material covered within that lab. **This however is not a complete listing as it would be impossible to list all of the ideas covered on one sheet of paper.** It is suggested that you understand all of the material and questions found in the labs themselves, reread all of the textbook readings assigned for each lab as listed in the lab outline and study and understand all of your notes that you took in lab. If you missed a lab it is highly recommended that you go watch, listen and take notes on the PowerPoint presentation, as posted on Blackboard, for the lab that you missed. You must bring a calculator, pencil, eraser and colored pencils to your lab midterm.

**Using Doppler Radar: WSR-88D - know:**

- the three general uses of the WSR-88D
- why its important for everyone to be able to read and understand a current radar image
- how the WSR-88D collects Base Reflectivity data
- how to read a radar reflectivity image to determine weather areas of light or moderate or heavy or no precipitation are occurring
- that orange, red, purple on the reflectivity image indicate thunderstorm activity
- that white on the reflectivity image in the winter indicates snow
- the unit for radar reflectivity is dBZ
- how to tell on a radar image the type of precipitation that is falling (rain vs freezing rain vs snow)
- how to predict when it will start or stop precipitating by looking at a time series of radar images (loop)
- how to read the day and time range (from-to) a series of radar images (loop) is from
- how to read a Storm Total Precipitation image from the WSR-88D to determine how much precipitation has fallen over an area
- how to read the day/time range (from-to) on from a Storm Total Precipitation Image
- the unit for Storm Total Precipitation is INS (which is an abbreviation for inches)

**Isopleth Analysis - know:**

- the definition and purpose of isopleth's
- the difference between an isopleth and an isotherm
- the rules for drawing isopleth's and make sure that you don't violate them

**Isotherms - know:**

- how to draw isotherms on a map of the United States
- the proper color used in drawing isotherms
- the proper increment and labeling technique to use when drawing isotherms
- if a given isotherm was drawn correctly
- when large scale (synoptic scale) storm systems are more to form and why
- which season has the largest temperature range and which season has the smallest temperature range across the U.S.
- which cities have a smaller annual temperature range, west or east coast cities and why
- how to identify cold air moving into the U.S. from Canada or warm air moving into the U.S. from Mexico or the Gulf of Mexico by looking at a map of isotherms
- the relationship between temperature and pressure
- how to tell which scale is being used on a thermometer
- the problems associated with disposing of mercurial thermometers (Science News Article)

**The Effect of Heat Capacity on Temperature - know:**

- the proper way to set up a graph (Format/Properties of a Graph)
- how to look at a graph of temperature vs time and tell which line on the graph represents the change in temperature of the soil or the water
- the definition of the term heat capacity
- the definition of the term specific heat
- the difference between the terms heat capacity and specific heat
- the specific heat values of the various substances we discussed (from the lab handout) and what they mean
- that air heats up faster than sand, soil and water and know why
- the unit for specific heat
- why water heats up and cools down slowly
- why land heats up and cools down quickly
- which will be warmer in the summer and which will be warmer in the winter, the land or the ocean
- the definition of the word albedo
- what it means to have a high or low albedo
- some substances that contain either a high or a low albedo
- what thermal conductivity is and how it can effect the heating and cooling rates of a substance

- the difference between the words transparent and opaque and how that can affect the heating and cooling rates of a substance
- which substance, in the lab, **received** the most energy from the heat lamp
- which substance, in the lab, **absorbed** the most energy from the heat lamp
- how energy was transferred from the heat lamp bulb to the surface of each substance - radiation
- how the air is warmed from below - conduction and then convection along with infrared radiation (IR)

#### **Isobars - know:**

- how to code or decode pressure readings
- how to draw isobars on a map of the United States pressure readings
- know the 6 steps for drawing isobars as covered in the presentation
- the proper increment and labeling technique to use when drawing isobars
- all isobars to be drawn are based on the number 1000.0 +/- 4.0 (the list)
- how to put a L or a H onto the little city airport circle that contains either the lowest or highest pressure value
- the proper color and symbols to use when labeling areas of high and/or low pressure
- that clear or clearing skies is associated with high pressure systems or rising pressure and stormy weather is associated with low pressure systems or falling pressure
- if a given isobar was drawn correctly
- if a location on a map of pressures, contoured with isobars, is a high or low pressure center

#### **ASOS and METAR - know:**

- the former name of the National Weather Service before 1970
- what the acronym ASOS stands for
- the 11 weather variables measured by ASOS
- why most ASOS's are located at airports
- in general how often an ASOS measures and transmits a regular weather observation from an official ASOS station
- how to interpret a METAR report as you did on pages 10 and 11 of the lab (a METAR acronym decoding sheet will be provided for you)
- how to take a standard weather report and put it into METAR format
- how to convert from GMT/Z observation time into eastern standard time (EST) or eastern daylight time (EDT)
- the country codes K and C and what countries they represent
- that precipitation intensity is classified as either light, moderate or heavy
- the relationship between wind direction and a 360° compass
- the difference between sustained wind speed and wind gust speed
- not all observations have wind gusts
- if present, the wind gust speed will always be greater than the sustained speed
- temperature and dew point temperature on METAR reports is in °C
- air pressure on METAR reports is in inches of mercury
- how to convert pressure from mb to inches or vice versa if given the conversion factors
- all of the units used in METAR reports (knots, statute miles, feet, °C, inches, etc....)
- the three levels of clouds (high, middle and low) and their corresponding heights in feet
- whether a cloud listed on a METAR report is either under the high, middle or low category
- the general weather conditions that are **NOT** conducive for landing a airplane at an airport
- the standard FAA minimum visibility necessary to land an airplane

#### **Surface Station Models - know:**

- how often general weather observations are taken
- how to plot weather data on a station model
- how to decode/interpret a station model
- how to code/decode pressure
- that the variables covered will be temperature, dew point, sky coverage, pressure, pressure change, pressure tendency, wind direction, visibility, wind speed and present weather (including rain, snow, drizzle, thunderstorm and fog)
- the purpose of a station model
- all of the units associated with the surface station model
- the important number to remember for rounding visibilities is above 3 1/8 statute miles (ex 4 1/2 would become 5)
- that for visibilities below 3 1/8 statute miles you would not round and use any given fractions of miles (ex 2 1/2 would stay at 2 1/2)

#### **Other Important Notes:**

- **Remember an isotherm analysis will be 10% of your lab midterm exam**
- **Remember an isobar analysis will be 20% of your lab midterm exam**
- **Interpreting a METAR report will be 15% of your lab midterm**