STUDY GUIDE for Exam One: **STUDY EARLY AND STUDY WITH OTHERS!!**

Introducing Physical Geography

Why is geography an *integrative* discipline?

How is “why what is where and so what?” a uniquely geographic question?

What constitutes a spatial viewpoint? What are space, place and scale?

How do physical and human geography differ?

What are the 4 spheres of physical geography?

**Home Planet**

“Where” are we in space?

What is the Milky Way?

Know basic dimensions of earth: radius, diameter, circumference, distance from sun, axial tilt angle, directions of revolution and rotation, shape of earth, shape of orbit, eccentricity of orbit.

How did Eratosthenes calculate circumference of earth?

How do latitude and longitude differ? How are they used and designated?

Know approximate latitude/longitude of Duluth.

Terms to know: oblate ellipsoid, perihelion, aphelion, Plane of the Ecliptic, ellipse, graticule, Prime Meridian, International Date Line, Central Meridian, solar day, local TIME

**Seasons**

Reasons for the seasons

For solstices and equinoxes, know latitudes and location of: subsolar point, circle of illumination, tangent rays.

Know how to calculate angle of noon sun or how to solve for latitude, given the angle of the noon sun and the date.

Latitudes to know: Arctic and Antarctic Circles, Tropics of Cancer and Capricorn, equator, North and South Poles.

**Radiation and Insolation**

What does “insolation” stand for?
Solar constant, electromagnetic radiation, wavelength, electromagnetic spectrum, sensible and latent heat, conduction and convection, albedo

How are energy per unit area and solar angle related?

What is the source of the sun’s energy?

How does the terrestrial radiation from the earth differ from the solar radiation of the sun?

What molecules in the atmosphere absorb shortwave radiation and which absorb longwave radiation?

What are greenhouse gases?

What is the difference between absorption and reflection?

What is the albedo of the earth/atmosphere?

What is the shortwave balance? What are the absorbers and reflectors of shortwave?

What is the role of clouds in the shortwave budget?

What is the longwave balance?

What is counterradiation? How is it related to the greenhouse effect?

What are the natural and the enhanced (anthropogenic) greenhouse effects? How do the shortwave and longwave budgets achieve an overall energy balance?

Be able to explain the latitudinal, daily(diurnal) and seasonal differences in radiation and insolation.

**Temperature**

Definition of temperature

Know how to convert from one Temperature scale to another.

What factors control the temperature of a place? Know each of the factors and their effect on temperature.

Why is there a “lag time” between maximum insolation and maximum temperature? (Both annually asnd diurnally)

What is the urban heat island effect and what causes it?

What is specific heat?

Why does elevation affect temperature?
What is Vertical zonation?

What are the differences between the troposphere and the stratosphere? Know the altitudes of both.

What is a Temperature inversion?

TEXTBOOK READING: (These are important Figures to understand and things that were not discussed in lecture that you should know from the textbook). You should read the chapters in their entirety, however, since they explain the terms and processes we discuss in class.

Introduction:

Read the entire chapter. Some things to study that may not be emphasized in the lecture class include: Study the tools of physical geography, the meaning of Geographic Information Systems, and the spheres of physical geography.

Important Figures: I.3, I.5, I.17

Chapter One:

Read the entire chapter. Some things to study that may not be emphasized in the lecture class include: Great circles vs. small circles, the meaning of map projections, read the section on Geographic Information Systems (pp. 22-24)

Important Figures: 1.3, 1.4, 1.6, 1.8, 1.15, 1.16, 1.17, 1.20, 1.21, 1.22, 1.23

Chapter Two:

Read the entire chapter. Some things to study that may not be emphasized in the lecture class include: Know the composition of the atmosphere, read the section on the ozone hole (p. 58)

Important Figures: 2.1, 2.3, 2.5, 2.7, 2.8, 2.9, 2.12, 2.16, 2.18

Chapter Three:

Read the entire chapter. Some things to study that may not be emphasized in the lecture class include: Read the section about measuring air temperature (pp. 86-88), read the sections about urban temperatures (pp. 89-90), know the temperature structure of the atmosphere, study the section on world temperature patterns (pages 99 - 100); Read pages 103-109 about global warming.

Important Figures: 3.2, 3.8, 3.11, 3.14, 3.15, 3.16, 3.18