**Geology 340 Midterm Exam – Review Sheet**

**Lecture topics**

Coordinate systems

Celestial navigation –

Getting latitude from stars

Getting longitude from Greenwich time and local noon

See sample problem on website

Map types and map goals

Projections

Types - Cylindrical, Azimuthal, Conic

Tangent vs. Secant

Other (pseudocylindrical, sinusoidal, polyconic, etc.)

Projection goals

Conformal

Equal area

Equal distance

Tissot indicators - measuring distortion

Contouring

Hand vs. computer

Averaging

Triangulation

Surface fitting (spline technique and others); using tension like GMT can

GIS concepts

Spatial vs. attribute data – points, lines, polygons vs. values and traits

Vector vs. raster data

Relational databases – linking spatial and attribute data; key fields

Layers

GIS techniques

Creating maps

Importing data

Finding data on the web

Processing to make useful format (often in Excel)

CSV format

Using tables – linking attribute and spatial data – FIPS concept

Symbology and various representations of data we’ve used

Normalizing data

Raster and image formats (gridded data)

Bits, bytes, and representation of color (8 bit, 24 bit, alpha, indexed, etc.)

File formats – Bitmap, GIF, JPG, PNG

Compression regimes

Georeferencing

Affine transformations (straight lines stay straight, parallel stay parallel)

Translation

Scaling

Rotation

Shear

Matrix notation

1st and 2nd order polynomial best-fit raster-to-spatial connections in Arc

**Laboratories**

#1 Eratosthenes, Ptolemy, Bond, etc.

#2 GMT – projections

#3 GMT – contouring

#4 ArcGIS basics

#5 ArcGIS – linking data

#6 Georeferencing

**Readings**

On course web page, plus GMT manual pages