ES341 Fundamentals of GIS - Final Study Guide

Study Tips

-Read all chapters in book, study figures and tables, compare chapters to notes
-Use study guide as a check list for knowing key terms, key concepts, key skills
-Go back through the class / lab exercises, make sure you can do the math work
-Go back through the key skills emphasized in the tutorials, make sure you know the software skills
-I would study for a minimum of 10-12 hours if I wanted to do well on this exam.
-create a sheet of key ArcMap commands - bring to exam; it will make your job easier.
-bring a calculator to the exam.

Key Words and Skills Since Midterm

Map Projections – Part 2
x,y coordinates
map projection
georeference system
map registration
map resolution
metadata
datum
North American Datum
NAD1927
NAD1983
Geographic Coordinate System (GCS – WGS1984 lat. long.)
UTM Zone 10N NAD1927
UTM Zone 11N NAD1927
Oregon State Plane North
Oregon State Plane South
Oregon Statewide Lambert
Arc Toolbox
    Define projections tool
    Project tool
*.prj projection file

Geoprocessing (Price Ch. 7)
Geoprocessing defined
geoprocessing tools
geoprocessing of shape files
merge
clip
dissolve
erase
intersect
union
append
buffer
clipping functions
merging shape files
polygon editing
splitting polygons
merging polygons
polygon islands
Arc Toolbox
Feature extraction
Data export

Data Editing (Price Ch. 12-13)
Editor Toolbar
Point-snapping
Data editing
Remove dangle nodes
Edge matching
creating shape files
heads-up digitizing
convert to shape file
polygon tool
split polygon tool
complete polygon tool
shape editing
editing shapes
vertex
vertex tolerance
snap tolerance
node
shape split
shape merge
split tool
digitizing polygons
digitizing polylines
vertex editing
adding points to shapes
adding polygons to shapes
adding lines to shapes
saving edits to shapes
rotating features
deleting features
create features

Attribute Data / Editing / Queries (Price Ch. 4,5,6)
Data table
Relational database
Categorical data
Numerical data
attribute database
fields
records
geodatabase
*.dbf file
table editing
add field
table link
table join
spatial join
attribute data calculation
field calculator
field types
floating point
single precision
double precision
string (text)
integer
precision
scale
query tools
query building
logical expressions
key fields
one-to-many relations

SQL
Attribute queries
Spatial queries
Feature selection
Feature extraction

Special File Types
DEM Data *.dem
DRG Data *.tif *.tfw
Shapefile (*.shp, *.dbf, *.shx)
ARC/INFO export file (*.e00)
Arc/Info GRID (raster)
ArcGIS geodatabase (*.mdb)
OrthophotoQuads (*.sid *.sdw)
DOQ
*.zip – zip file
Tar.gz - unix tar file
*.xml metadata file formats

Spatial Analyst / Raster Analysis
Spatial analyst extension
Discrete point data
Grid format
DEM
ASCII format
Binary format
Grid attributes
raster data
grid themes
georeferencing rasters
world file
rectification
Control Points
legend editor
spatial analyst extension
symbolization – stretch
symbolization – classify
symbolization – unique values
DEM
elevation grid
inquire tool
cell value
Grid Data Source
color ramp
hillshade
theme - convert to grid
surface-derive slope
surface - compute hillshade
surface - create contours
file-manage data sources
theme-convert to shape file
query builder for grids
classify legend
Analysis- Calculate density from point file
grid interpolation
creat contours from grid theme

Terrain Mapping
DEM / DTM
surface - create contour map
surface - create hillshade map
surface - create slope map
surface-create aspect map

Map Algebra
Raster calculator
grid map algebra
matrix algebra
map calculator - evaluate
algebraic transformation of grid

Data Display
legend editor
annotation
map classification
polygon labels
text labels
label tools
labeling map feature from dbase

Lidar Concepts
LIDAR
Laser
Laser pulse
EM spectra
Speed of light
Wavelength
Frequency
Reflection
Absorption
Two-wave travel time
Laser source
Pulse detector
kHz – kilohertz
first-returns
second-returns
last returns
bare-earth model
digital elevation model
DEM
1-m resolution
Point density
Pulse intensity
Post-processing algorithm
Aerial surveys
Laser swath mapping
Land classification
Vegetative structure
Ground cover
Flight lines
Overlap
Sidelap
Flight plan
TIN
GRID
DEM
Data correction
Roll-yaw-pitch
GPS – positioning systems
Errot correction
Urban modeling
Watershed modeling
Topographic analysis
Resolution
Positional accuracy
Pulse rate
Point density
Altitude
Field of view
Multiple-return lidar
Near-infrared
Water absorption
Fog-rain-absorption
Point cloud
Laser altimetry
First-return model

Metadata (Price Ch. 15)
FGDC standards
*.xml file format
Lineage
Positional accuracy
Attribute codes
Spatial reference

Key Software / Analytical Skills

Can you work with the following tools?

spatial analyst, projection utilities, geoprocessing tools, editor toolbar?

do you know the basic functions of these tools, the types of data they are used with, the types of analytical procedures that can be performed with them?

Can you create a nice looking map in layout and print it out?

Can you define, project and reproject data?

Can you incorporate raster and vector data in a GIS exercise?

Can you perform a slope analysis using spatial analyst?

Can you create a hill-shading model using spatial analyst?

Can you create vector and raster-based queries to identify select areas on a map?

Can you add data to a table using the table editor?

Can you use the geoprocessing to clip, dissolve, merge data?

Can you find and download gis data from web sites, convert and decompress the data?

Can you use the editing tools to create and edit polygons?

Can you employ heads-up digitizing to create your own shape files? Can you use image analyst to mosaic air photos?

Can you use a photo / image base and create a shape file via digitizing?

Do you know what the following files / data types are: *.e00, *.shp, *.grd, Mr. Sid, *.tif, *.jpg, *.tfw, *.sdw, *.zip, *.tar.z, DOQ, DRG, DEM

Can you download and import a USGS DEM into an arcview / spatial analyst grid format?

What's the difference between an *.dem and *.grd file format?

Can you manage *.zip and *.tar.gz files?

Do you understand basic concepts of map algebra and what types of data it's used on?

Anticipate: 2-3 essay questions focusing on broad summaries of GIS, the types of applications it may be used for, the components of ArcMap specifically.

GOAL OF FINAL EXAM: To test your ability to use ArcMap and ArcToolbox as a tool to ask questions of spatial data.