IST 423 sec.201– GIS and Data Systems

CRN 3739 9:30pm – 10:45pm TR ML 122 Spring 2015

**Instructor:**

Thomas G. Jones

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**Required Text:**

Getting to Know ArcGIS Desktop Third edition

**Course Description:**

The purpose of this class is to introduce you to GIS software and to explore the capabilities of using GIS-related information to solve problems, answer questions and to explore new ways of looking at the world. The software used in this class is ESRI ArcGIS, one of the most prevalent mapping software used anywhere. You will also learn terminology related to mapping and more traditional mapping methods, as well as GPS technology and how it can be integrated into the software. A part of the class involves basic database terminology and creation, and using databases with ArcGIS. We use Microsoft Access in this class; although it is not the best database software available, the concepts used in Access are applicable to other database classes you may have taken or will be taking.

**Course Content:**

ArcGIS:

Chapter 1 & 2- Introducing GIS and ArcGIS Desktop

Chapter 3 – Interacting with maps

Chapter 4 – interacting with data

Chapter 5- Exploring online resources

Chapter 6 - Working with coordinate systems and projections

Chapter 7 – Symbolizing features

Chapter 8 – Classifying features

Chapter 9-Labeling features

Chapter 10- Making maps for presentations Chapter 11 –Building geodatabases Chapter 12- Creating features

Chapter 13 – Editing features and attributes

Chapter 14 – Geocoding addresses

Chapter 15 – Querying data

Chapter 16- Joining and relating data

Chapter 17-Selecting features by location

Chapter 18- preparing data for analysis

Chapter 19 – Analyzing spatial data

Chapter 20 – Analyzing raster data

General Material:

GIS Terminology Coordinate Systems GPS Units

Working with Topos

Working with Datasets (DOQQ's and CIR

Imagery, Topos, Shapefiles, etc.

Working with Google Earth (for instance, final GIS projects will likely also be saved as Google Earth .kml files).

**Course Student Learning Outcomes and Assessment Measures:**

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| **Course Student Learning**  **Outcomes** | **How Practiced in this Course** | **How Assessed in this**  **Course** |
| Students will be introduced to GIS  Software | Explore ESRI ArcMap and ArcCatalog;  symbolization of GIS data | Text read Chap 1& 2; Read and complete tutorial in Chap  3-5; Home Projects 1& 2;  Quiz 1; Midterm & Final  Exams |
| Students will learn about projections and how to project GIS data in ArcMap | Presentation on coordinate systems; determining scale on a map and how it relates to real-world distances | Text read and complete Chap  13; Home Project 3 & GPS Project 1; Quiz 1; Midterm & Final Exams |
| Students will learn GPS technology and how it can be integrated into the software | Presentation on coordinate systems; use  GPS to gather points around campus | GPS Project 2; Quiz 1; Midterm & Final Exams |
| Students will learn how to read traditional topographic maps and how to calculate coordinates on a traditional coordinate map | In-class instructions on topographic maps and in-class step-by-step instructions on using the map and a ruler to calculate coordinates | Home Project 5; Quiz 1; Midterm & Final Exams |
| Students will learn to classify GIS  data and label these data | Use ArcMap capability to classify data visually using different classification systems and label data | Text read and complete Chap  6 & 7; Home Projects 3-5; Midterm & Final Exams |
| Students will learn basic database terminology and creation and use databases with ArcGIS. | Use Microsoft Access to create simple databases using tables, forms and queries. Import Access tables into ArcMap to create  GIS data | Access Projects 1-4; Home Project 7; Quiz 2; Midterm & Final Exams |
| Students will learn how to query data in ArcMap and how to create relationships between tables to  create/append data | Use ArcMap Select by Attribute to query existing GIS data and to create joins/relates among tables | Text read and complete Chap  8 & 9; Home Project 6; Quiz  2; Final Exam |
| Students will learn how to use locational information within data to  answer questions related to location | Use ArcMap Select By Location | Text read and complete Chap  10; Home Project 8; Final  Exam |
| Students will learn how to prepare and analyze spatial data | Use ArcMap Geoprocessing functions such as Clip, Union & Dissolve; Use Buffer functions and table Calculator | Text read and complete Chap  11-12; Home Project 8 & 9; Final Exam |
| Students will learn how to build  geodatabases | Use ArcCatalog to create geodatabases | Text read and complete Chap  14; Quiz 2; Final Exam |
| Students will learn how to create and edit GIS data and associated attributes | Use ArcCatalog and ArcMap to create various kinds of GIS data; use ArcMap Editor to edit these data and their  associated attributes | Text read and complete Chap  15-16; Home Project 10; Final  Exam |
| Students will learn how to geocode  Addresses | Use ArcMap's geocoding functions | Text read and complete Chap  17 |
| Students will learn how to make maps from templates and make  maps for presentation purposes | Use ArcMap Layout functions | Text read and complete Chap  18-19; Home Project 11; Final  Exam |

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| Students will learn how to create data models | Use ArcMap ModelBuilder | Text read and complete Chap  20 |
| Students will define community- based learning and service learning and your role as a civic participant through the creation of a GIS product that will meet our community partners' needs | In-class discussions, in-class Q&A, meetings with community partner, assessments by Service Learning Program, final project | Read and discuss ({Community Engagement for Student Learning in Geography"  Journal of meetings and project progression Online assessments and focus group by MUSLP Final project and presentation |

**Class Attendance:** In this course the instructor will require active participation of each student during each class meeting. Class participation points and homework will only be accepted late, when accompanied with appropriate documentation. By missing class you will not be able to participate in class discussions and the class will not benefit from your ideas and comments. If you are absent, you must contact the professor as soon as possible.

**Students with Disabilities:** Marshall University is committed to equal opportunity in education for all students, including those with physical, learning and psychological disabilities.  University policy states that it is the responsibility of students with disabilities to contact the Office of Disabled Student Services (DSS) in Prichard Hall 117, phone 304 696-2271 to provide documentation of their disability.  Following this, the DSS Coordinator will send a letter to each of the student’s instructors outlining the academic accommodation he/she will need to ensure equality in classroom experiences, outside assignment, testing and grading.  The instructor and student will meet to discuss how the accommodation(s) requested will be provided.  For more information, please visit <http://www.marshall.edu/disabled> or contact Disabled Student Services Office at Prichard Hall 11, phone 304-696-2271.”

The reason for this request is so that students with disabilities understand both their rights and responsibilities regarding requesting accommodations.

**Policy on Academic Dishonesty:** I take cheating very seriously. I will follow the student handbook on definitions and actions precisely.

**Other Policies:**

By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to [www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs) and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to <http://www.marshall.edu/academic-affairs/?page_id=802>

Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

**Requirements:**

Assignments Possible Points

Class Participation 300 pts

Student Project 200 pts

Computer midterm 100 pts

Computer final 100 pts

Reading Quizzes 100 pts

Knowledge Celebration 1 100 pts

Knowledge Celebration 2 100 pts

Total: 1000 pts

**Assignment Details:**

1) Points for class participation come from a series of small tasks assigned during class time and as homework. These brief projects will be submitted via email.

2) Each student or group of students as OK’d by professor will complete a project agreed upon by the professor

3 & 4) Students will complete a series of questions exhibiting their abilities to utilize the ArcMap software.

5) Most classes will begin with a simple 10 point quiz on the reading materials assigned. The goals of these quizzes are to inform students on their current retention of assigned readings and to introduce topics for discussion.

6 & 7) Two knowledge celebrations “written exams” will be given. The first exam will be given at midterm and the second as a final.

**Grading Scale:**

90% - 100% = A

80% - 89% = B

etc…

**Office Hours**

Tuesday 8:30 am to 9:15 am and 2:30 to 3:30 pm; Wednesday 1 pm to 5 pm if scheduled ahead of time; Thursday 2:30 pm to 3:45 pm

**Schedule**

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| **Date** | **Assignments** |
| Jan 14 | Discuss Syllabus, GPS, and class introduction  For Homework: Read chapters 1 to 2 |
| Jan 21 | In Class: Chapters 1& 2  For Homework: read chapter 3 |
| Jan 28 | In Class: GPS & chapter 3; Download GPS Points  For Homework: Read Ch. 4 |
| Feb 4 | In class: Chapter 4  Homework: Home Projects read 5 |
| Feb 11 | In class: Chapter 5  Homework: Chapter 6 |
| Feb 18 | In class: Chapters 6 & 7  Homework: Review for Midterm |
| Feb 25 | Midterm Chapters 1 to 7 (entire class period)  Homework: read chapters 8 & 9 |
| March 4 | In class: Chapter 8  Homework: read chapter 10 & 11 |
| March 11 | In Class: Tutorial Ch. 9  Homework: read chapters 10 & 11 |
| March 25 | In Class: Tutorial Ch. 10,11  Homework: Read 12 & 13 |
| April 1 | In Class: Chapter 12 & 13  Homework: read 14 |
| April 8 | In Class: Chapters 14  Homework: Chapters 15 |
| April 15 | In Class: Chapters 15  Homework: Chapters 17 & 18 |
| April 22 | In class: Chapters 17 & 18; Project Presentations  Homework: Chapters 19 & 20 |
| April 28 | In class: Chapters 19 & 20; Review for Final Exam; Project Presentations |
| May 6 | Final Exam 8 am |

**\*This is subject to change due to weather, absences, etc.**