



**Course** GISC3304/GEOG 3304/GEOS 3304: Principles of Geospatial Information Sciences

**Professor** Vaishnavi Thakar

**Term** Fall 2016

**Meetings** Friday 1:00 PM - 3:45 PM, GR 3.402 A & GR 3.402 B

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#### **Instructor's Contact Information**

**Office Location** GR 3.414

**Email Address** vxt110130@utdallas.edu

**Office Hours** Thursday 1:00 – 2:00 PM or by appointment.

**Other Information** We will use the new eLearning for this class. Please contact me through eLearning for all class related issues.

#### **General Course Information**

**Pre-requisites, Co-requisites, & other restrictions** There are no formal prerequisites; however students will be expected to have competence in microcomputer use, familiarity with MS Windows XP (file management, directories, subdirectories, copying, etc), MS Word, MS Excel and Internet usage.

This course examines in detail the fundamentals of Geographic Information Systems (GIS) and their applications. These systems are often the core of local (city, county) government operations, are being rapidly adopted by state and federal governments to manage operations from highway planning to environmental resource conservation, and are playing a major role in businesses as diverse as market research, site selection, real estate, civil engineering, and geophysical exploration. Additionally, academic research in disciplines ranging from the Social Sciences to the Geosciences is using GIS to expand research possibilities and productivity.

**Course Description** GIS is a combination of software and hardware with capabilities for manipulating, analyzing and displaying spatially-referenced information—that is, information which is referenced by its location on the earth's surface. By linking data to maps, a GIS can reveal relationships not apparent with traditional item-referenced information systems and data base management products, and by displaying information in a graphic form can communicate complex spatial patterns succinctly. The course emphasizes the concepts needed to use GIS correctly and effectively for manipulating, querying, analyzing, and visualizing spatial-based data. It also develops basic proficiency in industry standard GIS software usage for analyzing spatial patterns in social, economic, environmental and geologic data, and for generating cartographic output from the analysis.

The course will comprise both lecture and lab. The lab component will focus on the use of ArcGIS (Version 10.4.1) software in a Windows 7 environment in the Green Computer Lab (GR3.602, GR 3.402 A, B & 3.206). (The software will not be available in the university's McDermott Microcomputer lab.)

**Learning Outcomes** At the end of this course, students will be able to:

- Understand the fundamental concepts of geographic information systems.
- Utilize modern industry-standard GIS software for conducting basic GIS analyses and producing cartographic output.
- Conduct studies typically carried out in GIS including site selection, analysis of spatial processes, geocoding and point pattern analysis, and corridor studies.

**Required Texts & Materials**

- Longley, P., M., Goodchild, D. Maguire, and D. Rhind, 2015, *Geographic Information Systems & Science*, 4<sup>th</sup> edition, John Wiley & Sons, ISBN: 978-1-118-67695-0 [LG]
- Law, M. and A. Collins, 2015, *Getting to Know ArcGIS (for ArcGIS 10.2 and 10.3)*, 4<sup>th</sup> edition, ESRI Press, ISBN: 978-1-58948-382-8 [LC]

**Assignments & Academic Calendar**

Students are expected to have read the assigned chapters prior to coming to class (class topics may be modified).

Week	Date	Topics	Reading
1	Aug 26	Introduction: What is GIS? Assignment : Exercise 0	[LG] Ch 1, 3
2	Sep 2	<b>Exercise 0 Due</b> Lab1: Introduction to ArcMap	[LG] Ch 6 [LC] Ch 1, 2, 3 (Parts of Ch 7,8, 10, 14, 15, 17)
3	Sep 9	Lab2: Introduction to ArcCatalog and GIS Applications	[LG] Ch 11 [LC] Ch 4 (Parts of Ch 10,13, 15, 17)
4	Sep 16	<b>Lab 1 Due</b> The World (Terrestrial Data Structures) <b>(Quiz1)</b>	[LG] Ch 4 [LC] Ch 6
5	Sep 23	<b>Lab 2 Due</b> Representing Geographic Features (GIS Data Structures) <b>(Quiz2)</b>	[LG] Ch 3, 7, 8
6	Sep 30	Data Quality <b>(Quiz3)</b>	[LG] Ch 5
<b>7</b>	<b>Oct 7</b>	<b>Midterm Exam</b>	
8	Oct 14	Lab 3: Data Input-Internet Acquisition	[LC] Ch 6, 13
9	Oct 21	Data Input—(Preparation and Integration) <b>(Quiz4)</b>	[LG] Ch 9 [LC] Ch11
10	Oct 28	<b>Lab 3 Due</b> Lab 4: Data Editing and Topological Structures	[LC] Ch 15, 16, 17
11	Nov 4	GIS Analysis and Modeling <b>(Quiz5)</b>	[LG] Ch 13, 14, 15
12	Nov 11	<b>Lab 4 Due</b> Lab 5: Spatial Analysis	[LC] Ch 13, 16, 18
13	Nov 18	Data output, Application Examples & The Future of	[LG] Ch 11

		GIS (Quiz6)	(review) 12, 17-19
14	Nov 25	<b>Fall Break</b>	
15	Dec 2	<b>Lab 5 Due</b> TBD	
<b>16</b>	<b>Dec 9</b>	<b>Final Exam</b>	

### Course Policies

<b>Grading (credit) Criteria</b>	<ul style="list-style-type: none"> <li>• 10% Quizzes, attendance &amp; participation</li> <li>• 50% Lab Assignments</li> <li>• 40% Exams</li> </ul> <p>93-100 points = A; 90-92 points = A-  87-89 points = B+; 83-86 points = B; 80-82 points = B-  77-79 points = C+; 73-76 points = C; 70-72 points = C-  67-69 points = D+; 63-66 points = D; 60-62 points = D-  59 and below = F</p>
<b>Make-up Exams</b>	No Make-up project will be given without a legitimate excuse accompanied by proper formal documentation (e.g., a doctor's excuse).
<b>Extra Credit</b>	Will be given to optional lab assignments.
<b>Late Work</b>	Late submission for labs will be penalized 10% per day. Late submission after one week from the due date will not be graded.
<b>Special Assignments</b>	TBD
<b>Class Attendance</b>	Class attendance is mandatory and will be taken in various forms including in-class quiz. Students are expected to arrive to class on time and actively participate in class discussion.
<b>Classroom Citizenship</b>	Please make sure you turn off your cell-phone before coming to the classroom. Viewing anything that is not related to class and communicating with others using instant messenger are prohibited during the class.
<b>Academic Dishonesty</b>	All suspected cases of academic dishonesty (cheating, plagiarism, collusion, etc.) will be immediately forwarded to the Office of Judicial Affairs. Students have a right to due process through Judicial Affairs, but if the accused student is found guilty of misconduct, Judicial Affairs has sole authority for determining punishment.
<b>UT Dallas Syllabus Policies and Procedures</b>	<a href="http://go.utdallas.edu/syllabus-policies">http://go.utdallas.edu/syllabus-policies</a>

*The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Instructor.*