

**Syllabus - GIS DATABASE DESIGN &  
ANALYSIS FORY 5480/6480 (Spring 2023)**

1. **Course Title:** GIS DATABASE DESIGN & ANALYSIS
2. **Credit Hours/Prerequisites:** 2 Credit hours – 1 hour lecture (1); 1 hour lab (1)  
Prerequisite: FORY 5470 or equivalent
3. **Instructor:** Dr. Sanjiv Kumar, Assistant Professor, School of Forestry and Wildlife Sciences, Email: [szk0139@auburn.edu](mailto:szk0139@auburn.edu)
4. **When and Where:** Friday (2.00 pm to 4.50pm Lab)  
  
FORY 2216
5. **Office hours** By appointment
6. **Texts or Major Resources:**
  - **Focus on Geodatabases in ArcGIS Pro** by David W. Allen Esri Press.  
Data for book is available at the following website  
<https://learn.gis.com/home/group.html?id=4e4e241a8d48421a813e081549b2e142&view=list#content>
  - **Python scripting for ArcGIS Pro** First Edition by Paul A. Zandbergen
  - Please check the canvas regularly. I will upload relevant course material on canvas.
7. **Course Description:**

This course is designed to provide students with an advanced understanding of GIS (Geographic Information System) technologies, with an emphasis on database planning, design, creation, management, and analysis.

Students are expected to analyze large geodatabases using python programming in the ArcGIS Pro.

Students will implement concepts learned in the preparation and presentation of a decision support system.
8. **Course Objectives:**

Having completed this course, the student will be able to:

  - Describe key concepts in Database Management System
  - Proficiently run GIS tool (ArcGIS Pro)
  - Analyze geodatabase using **python programming**
  - Implement GIS tool in natural resource planning and management

**9. Grading:**

Exams will be based on readings, class lecture notes, and lab exercises. The final exam may be comprehensive.

Final Exam	20% (written + lab)
Mid-term	20% (written + lab)
Homework and Quizzes	40% (10 Assignments + Quizzes)
Term Project	20% (10% report + 10% presentation)

Final grades will be based on a 90-80-70-60 scale, but the instructor reserves the right to curve up.

For Graduate Students (FOR Y 6480), there will be an additional four reading assignments, for which they will submit a 1-2 pages summary report. Reading assignments will be graded for a total of 20 grade points. So, the maximum grade points a graduate student can obtain is: 120.

**10. Course policies**

**COVID19 Policy:** Please follow the university guidelines

**Attendance:** Students are expected to attend all classes and will be held responsible for any content covered in the event of an absence.

**Excused Absences:** Students are granted excused absences from class for the following reasons: illness of the student or serious illness of a member of the student's immediate family, the death of a member of the student's immediate family, trips for student organizations sponsored by an academic unit, trips for university classes, trips for participation in intercollegiate athletic events, subpoena for a court appearance, and religious holidays. Students who wish to have an excused absence from class for any other reason must contact the instructor in advance of the absence to request permission. The instructor will weigh the merits of the request, and render a decision. When feasible, the student must notify the instructor prior to the occurrence of any excused absences, but in no case shall such notification occur more than one week after the absence. Appropriate documentation for all excused absences is required. Please consult the *Student Policy* eHandbook for more information on excused absences.

**Make-Up Policy:** Arrangement to make up a missed major examination (e.g.: hour exams, mid-term exams) due to properly authorized excused absences must be initiated by the student within one week of the end of the period of the excused absence(s). Except in unusual circumstances, such as the continued absence of the student or the advent of

university holidays, a make-up exam will take place within two weeks of the date that the student initiates arrangements for it. Except in extraordinary circumstances, no make-up exams will be arranged during the last three days before the final exam period begins.

**Academic Honesty Policy:** All portions of the Auburn University student academic honesty code (Title XII) found in the Student Policy eHandbook will apply to university courses. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee.

**Disability Accommodations:** Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 844-2096 (V/TT).

**11. Course Schedule**

<b>FOR5 5480/6480, Spring 2023</b>	
<b>Week 1-3</b>	<b>Module 1 - Designing Geodatabase from Scratch</b>
	<ul style="list-style-type: none"> <li>• Geodatabase Schema</li> <li>• Logical model</li> <li>• Creating geodatabase</li> <li>• Populating Geodatabase</li> <li>• Sharing Geodatabase</li> </ul>
<b>Week 4-6</b>	<b>Module 2 - Working with Geodatabase</b>
	<ul style="list-style-type: none"> <li>• Creating new features</li> <li>• Context menu and its use</li> <li>• Geodatabase editing</li> <li>• Feature template</li> </ul>
<b>Week 7</b>	<b>Module 3 - Geodatabase Topology</b>
	<ul style="list-style-type: none"> <li>• Topology concepts</li> <li>• Working with geodatabase topology</li> </ul>
<b>Week 8</b>	<ul style="list-style-type: none"> <li>• Mid term</li> <li>• Final project development</li> </ul>
<b>Week 9-11</b>	<b>Module 4: Geoprocessing using Python</b>
	<ul style="list-style-type: none"> <li>• Python Basics</li> <li>• ArcPy package</li> </ul>

	<ul style="list-style-type: none"> <li>• Exploring and manipulating spatial data</li> <li>• Use of cursor to find, insert, and update the data</li> <li>• Working with Geometry</li> </ul>
<b>Week 12-13</b>	<b>Module 5: Working with raster data using python</b>
	<ul style="list-style-type: none"> <li>• Raster data concepts</li> <li>• ArcPy Spatial Analyst module</li> <li>• Reaster Algebra</li> </ul>
<b>Week 14-15</b>	<b>Module 6: Advanced Topics in Geodatabase Analysis</b>
	<ul style="list-style-type: none"> <li>• Complex geodatabase analysis</li> <li>• Creating and sharing custom tools</li> </ul>
<b>Week 16</b>	<ul style="list-style-type: none"> <li>• Final Project presentation</li> <li>• Final Exam</li> </ul>

° subject to change based on student feedback and class speed.