Gerken

Spring 2025 Schedule for ISAT 420 – 0001

Updated: 01/16/2026

Lecture: Mondays & Wednesdays, 3:25-4:40 AM, EnGeo 1207

Week	Block	Specific Topics and Questions	Tools/ Concepts	Semester Project	Assignments/ Deliverables
1 Jan 22	Course Welcome	Course Welcome & Introduction - Who are we? - Why this course? - How will we learn?			
2 Jan 26	Basics	**Note:** ***I am at a conference this week. We will not be meeting this week, but there will be asynchronous assignments. We will discuss these when I am back in Week 3.*** Open Science - What is the problem with closed science? - What is open science? - What makes scientific data useful? Tools for Open Science and Analyzing Data - What are the tools we will be using in ISAT 420? - What are they used for? - What software do I need to install?	Tools - Anaconda Python (Jupyter Notebooks) - Markdown - Git with Github-Desktop Concepts: - Installing software - Developing reproducible workflows		- FAIR Principles Assignment - Install Software - Markdown Assignment
3 Feb 2		The need for reproducibility - How do git and github help with reproducibility and collaboration? - What are the basic workflows that we will apply in this course? Environmental Questions and Data - What questions can we ask? - How do we link environmental questions to data? - What needs to be done with data to answer questions with data? (Demonstration)	Tools: - Git/ Github - Anaconda Python Concepts: - Software Repositories - Commit and push - Forking a repository - Data – Model Hierarchy	Collect environmental issues	First Weekly Learning Note Practice: Git/Github Workflow
4 Feb 9	Working with environmental data	Case Study: Weather Station Data	Concepts: - Reading tabular data - Pandas dataframes - Descriptive statistics - Time series data	Select Topics and Form Groups	Weekly Learning Note Practice: Working with tabular data in Python

			- Making plots with python		
5 Feb 16		Case Study: Flood Risk - How do we make predictions from limited data? - How do we develop a flood model from streamflow data? - What are the pitfalls with extreme events?	Concepts: - Exploratory data analysis - Grouping data - Fitting a statistical model	Describe the Problem	Learning Reflection 1
6 Feb 23		Case Study: Air Quality Data - How do we deal with messy data? - How can we summarize data from different sources? -	Concepts: - Working with APIs - Selecting data - Applying what we learned …	Investigate Datasets	Weekly Learning Note Practice: Grouping, selecting, and plotting
7 Mar 2				Exploratory Analysis	Weekly Learning Note
8 Mar 19		Introduction to gridded data	Tools: - Python XArray		Weekly Learning Note
Mar 16-20	**Enjoy Your Spring Break**				
9 Mar 23		Case Study: Modis Satellite Data			Weekly Learning Note
10 Mar 30					Learning Reflection 2
11 Apr 6	Focus on Models	Models: What we have learned so far			Weekly Learning Note
12 Apr 13					Weekly Learning Note
13 Apr 20		Case Study: Wet-bulb temperature and the limit of human tolerance			Weekly Learning Note
14 Apr 27					Learning Reflection 3
15 May 4	Course Wrap-Up	Project Presentations Discussion: Course Conclusions? - What have we learned? - What comes next? - What are your take-aways?		Monday: Present your semester project results Friday: Submit your semester project report	
Exam Week					