HIRES Teaching Module

Geographical Information System (GIS) Module

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Students will learn basic concepts of Geographical Information System (GIS) and how the GIS is being used in the real world to support problem-solving and decision-making. Students will be able to use QGIS or ArcMap, ArcCatalog, and Arc Toolbox and learn how to use GIS for analysis, and effectively present data in map layouts. Students will be able to create and manage spatial databases and produce well-designed maps for presentation. Student will learn about vector and raster formats used in GIS. Student will also learn about data visualization process to use communicate information clearly in graphical form and gain an overview of the concepts used to visualize data. At the end module students will create StoryMap to present their GIS project.

Assignment: Students will be given assignments based on activities performed during the class. The examples of assignments include (1) importing data with latitude and longitude coordinates in GIS and creating maps, (2) Import excel or other data formats data in GIS and joining it Global or Local maps to create new maps using imported datasets.

Group GIS Project: Students are divided in several groups with 3-4 students in each group. In the GIS project, students are free to choose Earth System Science related topic, in consultation with the instructor. The project should have rich GIS elements. Students will be downloading data from various government website sources including Census bureau, NOAA, NASA, USGS, DOL, World Bank, UN, and educational institutes, etc. The grading in GIS project is based quality of GIS maps produced, presentation skills, effort in data processing and preparation, and analysis of data. Students are encouraged to ask questions after presentations.

Documents:
Students will access the class presentation and assignments via website link:
http://www.lakhankar.com/qgis.html

Assignment Submission: done via google drive folders for each assignment.

Lectures	**Data and Assignments**
Sub-Module 1: Introduction to GIS • Application of GIS • GIS Concept (Vector and Raster) • Introduction to QGIS	* GIS data Resources
Sub-Module 2: Processing and Importing data to ArcMap • Processing the tabular (Excel/Text) data • Importing tabular data in ArcMap • Mapping the imported GIS data	Lab Assignments: 1. Assignment 1 Download 2. Assignment 2 Download 3. Assignment 3 Download
Sub-Module 3: GIS Project • Creating / importing data • Analysis / plotting of GIS data • Creating ArcGIS StoryMap • Presentation of Project using StoryMap	GIS Data Sources Examples of Past StoryMap
GIS Project: students will independent project based on their area of interest. Instructor will help student in acquiring and processing data that will be imported in GIS framework.	