

GEOGRAPHIC INFORMATION SYSTEMS TECHNOLOGY

GIST 214: INTRODUCTION TO MAP SCIENCE

Foundational scientific principles and analytic tools for students to understand maps and cartographic practices. Geospatial technologies are an extension of these principles and practices but they cannot be fully understood, successfully deployed, or their data outputs analyzed without a basic understanding of map science principles and practices.

GIST 314: CARTOGRAPHIC DESIGN AND PRODUCTION

Cartography is a fundamental tool of geography; it is also a science and art in its own right. Cartography uses principles of design, perception, statistics, and communication. This course introduces students to cartographic design and production principles, a fundamental skill in GIS. Laboratory exercises give students additional experience with ArcGIS software.

GIST 315: PROGRAMMING I

Introduction to the fundamentals of programming for Geographic Information Systems using Python. Students will be taught elements, methods and theories of scripting in Python including how to write and manipulate functions, loops, strings, lists, dictionaries, and classes with an emphasis on how to apply these tools to writing scripts in the ArcGIS environment. The only way to learn programming is by doing, and therefore this course is based on weekly coding assignments, supplemented by traditional readings and lecture materials that will build students' conceptual understanding of their burgeoning skills. Assessment will be based on weekly assignments, two midterm exams, and one in class presentation. (Prerequisite: GIST 417)

GIST 330: INTRODUCTION TO REMOTE SENSING

Introduction to remote sensing principles, techniques, and applications, designed principally for those with no background in the field.

Crosslisted with: ENVS/GEN/GEOG/GEOS/WSM 330

GIST 414: WEB-MOBILE GIS

Introduces students to the expanding field of web and mobile-based mapping applications development. Students will apply skills gained in GIST I and Programming I and II to learn how to build interactive web and mobile apps that use geospatial data in an attractive format. (Prerequisite: GIST 417)

GIST 415: PROGRAMMING II

Builds upon the scriptwriting skills students learned in GIST 315. In this class, students will write scripts to automate workflows in ArcGIS and extend the tools already available in the ArcToolbox to achieve creative problem solving. Topics include using Python with Model Builder, preparing data as strings, lists, tuples, and dictionaries prior to use, using Python to run SQL queries, working with rasters in Python, automating mapping tasks, and developing custom scripting tools. In addition to weekly assignments and readings, assessment will be oriented around a single, student-directed project that will take the second half of the semester to complete. It will require students to write a simple script to accomplish a specified task in ArcGIS and present the results of their work to peers. (Prerequisite: GIST 315).

GIST 416E: GEOVISUALIZATION

Introduces principles and practices of Geovisualization (Geoviz) and softwares (Community and ERDAS Image).

Crosslisted with: GEOG/RNR 416E

GIST 417: GIS

Introduction to the application of GIS and related technologies for both the natural and social sciences. Conceptual issues in GIS database design and development, analysis, and display.

Crosslisted with: GEOG/RNR/SW/SWES 417

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GIST 418: INTRODUCTION TO SPATIAL ANALYSIS & MODELING

The course provides an introduction to the concepts and techniques used in spatial analysis and modeling. This is a survey course designed to introduce students to a wide array of techniques including: Point Pattern Analysis, Spatial Autocorrelation, Tests of Association, Regression, Map Algebra Functions, Overlay Approach, Fuzzy Logic Approach, and Cellular Automata. (Prerequisites: GIST 417, statistics)

GIST 420: ADVANCED GIS

Examines various areas of advanced GIS applications such as dynamic segmentation, surface modeling, spatial statistics, and network modeling. The use of high performance workstations will be emphasized.

Crosslisted with: GEOG/RNR 420

GIST 457: STATISTICAL TECHNIQUEST IN GEOGRAPHY, REGIONAL DEVELOPMENT, & PLANNING

Methods of gathering and analyzing data for the solution of geographical, urban, and regional planning problems, with emphasis on quantitative and statistical techniques used in spatial analysis and cartography, on the one hand, and program planning, on the other.

Crosslisted with: GEOG/PLG 457

GIST 470: APPLIED GIST

A GIST-based problem solving approach within the context of a student-directed project. Specific GIS skills covered include project planning, spatial data sources and acquisition, data compilation, coding, analysis, representation, and presentation of results. The course can be repeated for credit, as the topics will vary; each course will examine a different urban or environmental issue in the natural and social sciences using geographic information systems technology.

(Prerequisites: GIST 417)

GIST 482: INTEGRATED GEOSPATIAL TECHNOLOGIES

Use of geospatial techniques and methods (database design, GIS, GPS, remote sensing, programming) to design and development spatial products and applications. Students are complete an independent project where they design and develop an application and its associated database. (Prerequisites: GIST 417, GIST 330, GIST 315).

GIST 483: GEOGRAPHICAL APPLICATIONS OF REMOTE SENSING

Use of aircraft and satellite imagery for monitoring landforms, soils, vegetation and land use, with the focus on problems of land-use planning, resource management and related topics.

Crosslisted with: ENV5/GEOG/PLG/RNR 483

GIST 498: SENIOR CAPSTONE

A culminating experience for majors involving a substantive project that demonstrates a synthesis of learning accumulated in the major, including broadly comprehensive knowledge of the discipline and its methodologies. Senior standing is required.