GIS/Planning Option

The GIS (Geographic Information Science)/Planning Option in the Department of Earth Sciences is designed to offer students a mix of technical skills and academic training that prepares them for careers in local, state, and federal planning as well as opportunities in private consulting firms that are involved in the planning process. The GIS/Planning Option recognizes the growing importance of Geographic Information Systems and Science in our society and how these analytic tools are applied in a wide variety of settings. The GIS/Planning Option takes advantage of excellent GIS facilities, lab space, expertise, and software available on campus and allows students to learn in an active hands-on environment. Students are prepared as map makers (cartographers) spatial analysts, and planners. The Department of Earth Sciences has connections with various local, state, and federal planning agencies within Montana and throughout the West. As part of their training, students may also be able to take advantage of internship opportunities as a way to further prepare for a wide variety of professional careers within the fields of planning and resource management. The optimal degree for employment and advancement in the in GIS/Planning area is the Master's Degree, and this undergraduate option is an excellent preparatory degree for graduate study. Some students interested in college teaching or advanced research may require a Ph.D. degree.

At the Freshman and Sophomore level, students take introductory courses in physical and human geography, GIS and cartography, statistics, intermediate technical writing, and computer aided design (CAD). In addition, courses in economics and political science lay the foundation for understanding the broader context of the planning process. As juniors and seniors, students complete an advanced 2-course sequence in GIS/Spatial Analysis (GPHY 384/GPHY 484R) and take skills-related coursework in Remote Sensing and in GPS technologies. Focused electives include courses in geographical planning, urban and economic geography, tourism and recreational planning, and in the politics of development. Students also complete basic coursework in soils, geomorphology and weather and climate because these variables are critical in the planning process. Additional electives are available in advanced classes in geography, earth science, ecology, natural resources, water resources, and statistics allow students to specialize in areas of particular interest and develop their own emphases in subjects related to the geospatial sciences and the planning process. All students take the GIS Capstone course (GPHY 484R) which emphasizes independent study in the geospatial sciences through a semester project.

Courses Required in Department

Freshman Year	**Credits**
ERTH 101IN - Earth System Sciences	4
GPHY 121D - Human Geography	3
GPHY 141D - Geography of World Regions	3
ECNS 101IS - Economic Way of Thinking	3
MART 145RA - Web Design	3
M 151Q - Precalculus	4
WRIT 101W - College Writing I	3
University Core, Prerequisites and Electives	7
Year Total:	30
Sophomore Year	**Credits**
GPHY 284 - Intro to GIS Science & Cartog	3
ENSC 245IN - Soils	3
PSCI 210IS - Introduction to American Government	3
CSCI 127 - Joy and Beauty of Data	4
STAT 216Q - Introduction to Statistics & STAT 337 - Intermediate Statistics with Introduction to Statistical Computing or STAT 332 - Statistics for Scientists and Engineers	3-6
Take ONE of the following:	3
WRIT 201 - College Writing II	
WRIT 221 - Intermediate Tech Writing	
Take ONE of the following:	3
DDSN 114 - Introduction to CAD	
SRVY 230 - Intro to Surveying for Engineers	
University Core, Prerequisites and Electives	5-8
Year Total:	30
Junior Year	**Credits**
ERTH 303 - Weather and Climate	3
ERTH 307 - Principles of Geomorphology	4
GPHY 384 - Adv GIS and Spatial Analysis	3
GPHY 365 - Geographical Planning	3
GPHY 357 - GPS Fund/App in Mapping	3
Take ONE of the following:	3
GPHY 426 - Remote Sensing	
GPHY 429R - Applied Remote Sensing	
Take TWO of the following:	6
GPHY 322 - Economic Geography	
GPHY 325 - Cultural Geography	
GPHY 326 - Geography of Energy Resources	
GPHY 329 - Environment and Society	
GPHY 401 - Environmental Planning and Management Toolkit	
GPHY 445 - Adv. Regional Geography	
PSCI 423 - Politics of Development	
University Core, Prerequisites and Electives	5
Year Total:	30
Senior Year	**Credits**
GPHY 484R - Applied GIS & Spatial Analysis	3
Take SIX of the following:	18
BIOE 370 - General Ecology	
BIOE 375 - Ecological Responses to Climate Change	
BIOE 416 - Alpine Ecology	
CSCI 440 - Database Systems	
ERTH 432R - Surface Water Resources	
GPHY 401 - Environmental Planning and Management Toolkit	
GPHY 402 - Water and Society	
GPHY 411 - Biogeography	
GPHY 425 - Geographic Thought	
GPHY 441R - Mountain Geography	
GPHY 492 - Independent Study	
GPHY 498 - Internship	
NRSM 421 - Holistic Thought/Mgmt	
NRSM 430 - Natural Resource Law	
NRSM 453 - Habitat Inventory and Analysis	
NRSM 455 - Riparian Ecology & Management	
SRVY 375 - Analytic Photogrammetry and Remote Sensing	
STAT 411 - Methods for Data Analysis I	
STAT 412 - Methods for Data Analysis II	

STAT 436 - Introduction to Time Series Analysis	
STAT 446 - Sampling	
University Core, Prerequisites and Electives	9
Year Total:	30
Total Program Credits:	**120**

Note: A minimum of 120 credits is required for graduation; 42 of these credits must be in courses numbered 300 or above.