Snow Science Option

The Snow Science program in the Department of Earth Sciences provides a foundation for understanding the distribution of snow (geography), mechanics of snow (physics, engineering), composition of snow (chemistry), variability of snow (statistics), and ecological effects of snow (ecology, hydrology). Essentially, this degree is a strongly quantitative geo-science degree with a special emphasis on Snow Science and mountain system processes.

It is also one of the best pre-professional programs in the world for those who want to carry their interests in Snow Science into a professional career. Employment ranges from ski patrol, director of snow safety, avalanche-center employee, snow scientist with a federal agency, or consulting in the area of land use planning, transportation engineering, or avalanche protection.

The optimal degree for employment and advancement in snow science is the Master's Degree. Some students interested in college teaching or advanced research may require a Ph.D. degree. The snow science option is an excellent preparatory degree both for employment and for advanced graduate studies, especially in quantitative geo-science fields.

In the Snow Science Option, students progress through a broad-based core of courses that includes introductory geology and geography, calculus, chemistry, physics, weather and climate, geographic information systems (GIS), geomorphology, glacial geology, and mountain geography. In addition to the core of Snow Science courses, students examine spatial analysis of factors important to snow distribution, snow hydrology, snow melt, and the analysis of factors which influence the spatial distribution of snow or snow avalanches. The capstone course is snow dynamics and accumulation. Students are strongly encouraged to consider a graduate degree in snow science to prepare for professional jobs, but such training is not always required.

Courses Required in Department

**Freshman Year**
- ERTH 101IN - Earth System Sciences  
- ERTH 102CS - Topics in Earth Sciences (3 credits needed)*  
- GPHY 141D - Geography of World Regions  
- M 171Q - Calculus I  
- M 172Q - Calculus II  
- University Core and Electives **  
- Year Total: 30

**Sophomore Year**
- CHMY 141 - College Chemistry I  
- CHMY 143 - College Chemistry II  
- PHSX 205 - College Physics I  
- PHSX 207 - College Physics II  
- ERTH 303 - Weather and Climate  
- GPHY 121D - Human Geography  
- GPHY 284 - Intro to GIS Science & Cartog  
- University Core and Electives **  
- Year Total: 30

**Junior Year**
- ERTH 307 - Principles of Geomorphology  
- GPHY 357 - GPS Fund/App in Mapping  
- GPHY 365 - Geographical Planning  
- GPHY 402 - Water and Society  
- GPHY 411 - Biogeography  
- GPHY 425 - Geographic Thought  
- GPHY 426 - Remote Sensing  
- GPHY 457 - Adv GPS Mapping for GIS  
- GPHY 461 - Tourism Planning  
- GPHY 484R - Applied GIS & Spatial Analysis  
- ENSC 444 - Watershed Hydrology  
- ENSC 445 - Watershed Analysis  
- STAT 431 - Nonparametric Statistics  
- STAT 436 - Introduction to Time Series Analysis  
- STAT 437 - Introduction to Applied Multivariate Analysis  
- STAT 446 - Sampling  
- Year Total: 30

**Senior Year**
- ERTH 450R - Snow Dynamics and Accumulation  
- GPHY 441R - Mountain Geography  
- GEO 445 - Glacial Geology  
- STAT 401 - Applied Methods in Statistics  
- Courses from Core and upper Division Electives (below)  
- Year Total: 30

**Total Program Credits:** 120

* Students are required to take 3 credits of ERTH 102CS to fulfill department requirements as well as Core 2.0.
** No more than 10 credits from the departmental required courses can count towards the total credit requirements for Core 2.0.
*** Students with a grade less than B in calculus might consider taking STAT 216Q and STAT 217Q rather than STAT 332.

**Upper Division Electives: Take 21 credits from the following**
- ERTH 450R - Snow Dynamics and Accumulation  
- ERTH 484 - Quaternary Environment  
- GPHY 357 - GPS Fund/App in Mapping  
- GPHY 365 - Geographical Planning  
- GPHY 402 - Water and Society  
- GPHY 411 - Biogeography  
- GPHY 425 - Geographic Thought  
- GPHY 426 - Remote Sensing  
- GPHY 457 - Adv GPS Mapping for GIS  
- GPHY 461 - Tourism Planning  
- GPHY 484R - Applied GIS & Spatial Analysis  
- ENSC 444 - Watershed Hydrology  
- ENSC 445 - Watershed Analysis  
- STAT 431 - Nonparametric Statistics  
- STAT 436 - Introduction to Time Series Analysis  
- STAT 437 - Introduction to Applied Multivariate Analysis  
- STAT 446 - Sampling  

**Notes:**
- A C- is required in all curriculum courses to graduate by Regents' policy. This includes electives in this curriculum.
- A minimum of 120 credits is required for graduation.
- All offerings are dependent upon available staffing.
Font Notice

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Times was used instead of Adobe Garamond Pro.

The editor may contact Leepfrog for a draft with the correct fonts in place.