Interdisciplinary Master of Science in Geoinformatics

Geoinformatics centers on the understanding and use of geospatial information and development of spatially integrated methods to address issues related to physical, biological, environmental, and social processes. Geoinformatics encompasses the fields of Geographic Information Systems, remote sensing, spatial analysis, and visual analytics. The Interdisciplinary Master’s Program in Geoinformatics aims to provide students with education and research opportunities to address both fundamental and applied issues in geospatial information and methodology to understand social, natural, and virtual environments. The benefits of Geoinformatics education and research extend across the geo-science, environmental, biological, social, and behavioral sciences as well as engineering because the spatial dimensions of natural and built environments plus social interactions are of paramount importance for understanding classic questions about the natural world and the human environment.

The interdisciplinary program is designed to ensure every student a strong foundation on the fundamentals of geoinformatics yet to be tailored individually to each student’s needs with respect to their cognate field(s) of interest and career goals. Each student will complete required credit hours from blocks of core courses in geoinformatics and elective courses related to their cognate field(s). The core courses emphasize the fundamentals and advanced knowledge of Geographic Information Systems (GIS), Remote Sensing, Spatial Analysis, and Visual Analytics to develop spatial theories and novel applications through interdisciplinary graduate education in geoinformatics. These courses expand upon a range of information technologies, such as programming, database, and statistics. Therefore, Geoinformatics students need to acquire basic IT skills and exposure by taking at least one IT related courses. Students can choose one or more disciplines currently offered graduate programs at the university as their cognate fields upon approval of their advisors.

General Admission Criteria

TOEFL: Minimum 580 on paper, 240 on computer, or 95 on iBT TOEFL

GRE: Scores will be evaluated along with transcripts and letters of references. Students with higher GRE scores will be more competitive for admission and assistantships.

Statement of Research Interest and Career Goals: students sharing common interest with geoinformatics faculty as well as being able to articulate their thoughts on career development will be more competitive for admission and assistantships.

The Program

The program requires 30 credit hours, approved by the student's master's committee; a thesis is required. The program will include geoinformatics core courses, cognate discipline courses, and IT courses, complemented by graduate seminars to assure geospatial, computational, applied, and research competencies in Geoinformatics. The reminder of course work after required courses will include electives and research hours, approved by the student's thesis advisor.
I. **Core Geoinformatics courses.** At least 9 credit graduate hours from the following areas, selected from lists of courses for each area as approved by the faculty oversight committee and graduate liaison and made available to the students and Graduate College.

- GIS Principles and Applications
- GIS and Spatial Analysis
- GIS and Spatial Programming
- GIS and Spatial Modeling
- Environmental Remote Sensing
- Computational Remote Sensing
- Visual Analytics
- Remote Sensing Hydrology*
- Remote Sensing Applications in Hydrology and GIS*

(* The two remote sensing courses in hydrology have strong emphases on remote sensing methodology and image processing. While the courses center on hydrological issues, the image processing techniques and classification methods are fundamental and broadly taught in most fundamental and applied remote sensing courses. Hence, the two courses are included in the Core Geoinformatics Courses).

- Other GIS or Remote Sensing related courses approved by faculty advisor

II. **Cognate field courses:** At least 6 credit graduate hours from a cognate field, as approved by one’s thesis committee:

Cognate fields can be any graduate programs at OU, including geography, meteorology, hydrology, botany and microbiology, zoology, ecology, political science, sociology, psychology, anthropology, international area studies, etc.

III. **Information Technology courses.** At least 3 credit graduate hours from the following areas, selected from lists of courses for each area as approved by the faculty oversight committee and graduate liaison and made available to the students and Graduate College.

These information technology courses can be taken from any departments on campus, including Geoinformatics. For students with prior courses before they entered the program, the student’s thesis or dissertation committee can authorize waivers to the information technology courses if they judge competency of the students in the related information technology areas.

- Statistics courses: Statistics courses are commonly offered in sociology, zoology, engineering, and many other departments.
- Programming courses: Programming courses are available in Computer Science, Management Information Systems, Meteorology, and some engineering departments.
- Database courses: Database courses are available in Computer Science, Management Information Systems, and Library Information Science. Students with prior courses with databases shall select courses from other categories in Information Technology.
- Computation courses: Computational courses are courses with emphases on modeling. The requirements can be fulfilled by any modeling courses, such as Environmental Modeling, Carbon Cycles, Machine Learning, Game Theory and others that are commonly offered in Botany and Microbiology, Civil Engineering and Environmental Sciences, Industrial Engineering, Economics, and Computer Science.
IV. **Graduate Seminars.** At least 6 credit hours.

Two graduate seminar courses or other courses not offered for undergraduate credit as approved by advisor. The seminar courses will ideally include one core Geoinformatics seminar and one seminar in the identified cognate field.

V. **Seminar in Geoinformatics:** At least 2 graduate credit hours

This seminar consists of colloquia in Geoinformatics or related disciplines on campus, graduate research discussions, thesis updates, or study groups in emerging Geoinformatics topics. Students must enroll twice. Regular attendance, enrolled or not, is expected.

VI. **Research Hours:** At least 4 thesis hours.

VIII. **Electives:** Master’s thesis committee approved electives to complete credit hour requirements. The electives are not required for Master’s degree, but the electives may be transferred to course credits to one’s doctoral program if applicable.

**Additional Requirements to Thesis Committee Membership**

In addition to all the guidelines specified for Interdisciplinary Master’s Degree, the student’s committee requires a minimum of one member from Geoinformatics, one from cognate area, plus a third, and the thesis or dissertation must involve concepts, data, or methods from more than one discipline.