Course Requirements for the IGPI Geoinformatics Ph.D. Program

Course Requirements
The geoinformatics Ph.D. will require completion of a minimum of 72 s.h. beyond the bachelor's degree. Twenty-one semester hours must satisfy the Informatics/Geoinformatics requirements. The remaining 51 s.h. will be documented in an approved plan of study. Ph.D. students may take up to 6 hours of thesis hours.

The geoinformatics subprogram is part of the Interdisciplinary Graduate Program in Informatics (IGPI). All students within an IGPI program are required to take 9 s.h. of core courses. Required and elective courses meeting this requirement are listed below; those identified with an “*” are considered particularly appropriate for geoinformatics students.

Core Informatics Courses (9 s.h.):

**Introductory informatics (3 s.h.)**
- CS:3110 (22C:104) Introduction to Informatics
  (or equivalent coursework approved by the subprogram coordinating committee)

**Programming coursework (3 s.h.)**
Selected from:
- CS:3210 (22C:109) Programming Languages and Tools *
- BME:5320 (051:123) Bioinformatics Techniques
  (or equivalent coursework approved by the subprogram coordinating committee)

**Data handling coursework (3 s.h.)**
Selected from:
- MSCI:6421 (06K:275) Knowledge Discovery
- MSCI: 4220 (6K:186) Database Management II¹
- CS:6421 (22C:131) Knowledge Discovery
- CS:4400 (22C:144) Database Systems
- SLIS:6100 (21:124) Database Systems
- BIOS:5110 (171:161) Introduction to Biostatistics
- BIOS:5120 (171:162) Design and Analysis of Biomedical Studies¹
- STAT:3200 (22S:152) Applied Linear Regression
- STAT:5400 (22S:166) Computing in Statistics
- GEOG:4580 (044:141) Introduction to Geographic Databases*

¹Note: these are proposed additions to the core IGPI data handling courses

Core Geoinformatics Courses

A minimum 12sh of geoinformatics courses are required.

**Introduction to geoinformatics (3sh):**
- GEOG:3010 (44:118) Geographic Information Systems and Science (or equivalent coursework approved by the subprogram coordinating committee)

Geoinformatics electives (minimum of 9sh):

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To insure breadth, courses must be taken from 2 or more departments. Select from (3 s.h. each):

**The Department of Geographical and Sustainability Sciences:**
- GEOG:3500 (44:105) Introduction to Environmental Remote Sensing
- GEOG:3540 (44:109) Introduction to Geographic Visualization
- GEOG:3520 (44:110) GIS for Environmental Studies
- GEOG:4520 (44:128) GIS for Environmental Studies: Applications
- GEOG:4150 (44:137) Health and Environment: GIS Applications
- GEOG:4580 (44:141) Introduction to Geographic Databases
- GEOG:4500 (44:145) Applications in Environmental Remote Sensing
- GEOG:5060 (44:296) Topics in Geographic Information Science (can be repeated)

**The Department of Computer Science:**
- CS:4400 (22C:144) Database Systems
- CS:4420 (22C:145) Artificial Intelligence
- CS:4520 (22C:151) Computer Graphics
- CS:4700 (22C:177) High Performance and Parallel Computing
- CS:4720 (22C:174) Optimization Techniques

**The Department of Management Sciences:**
- MSCI:6421 (06K:275) Knowledge Discovery.
- MSCI:6600 (06K:286) Linear Programming
- MSCI:6800 (06K:278) Web Mining
- MSCI:7000 (06K:277) Management Sciences Topics (when topic applies)

**The Department of Statistics and Actuarial Sciences:**
- STAT:5400 (22S:166) Computing in Statistics
- STAT:6530 (22S:167) Environmental and Spatial Statistics

**The Department of Biostatistics**
- BIOS:5710 (171:201) Biostatistical Methods I
- BIOS:5720 (171:202) Biostatistical Methods II
- BIOS:5730 (171:203) Biostatistical Methods in Categorical Data
- BIOS:6310 (171:174) Introductory Longitudinal Data Analysis
- BIOS:7600 (171:290) Advanced Biostatistics Seminar (when topic applies)

**The Department of Earth and Environmental Sciences**
- EES:4870 (012:178) Applied Geostatistics
Spatial/spatiotemporal data mining and knowledge discovery
Spatial/spatiotemporal decision support systems

Relevant coursework or domain experts exists on campus in each of these topical areas

**Advising and Committee Composition**
Students are expected to identify a faculty member with expertise in their area of interest and ask that individual to be their advisor. Students who arrive on campus without an identified faculty advisor will be assigned one by the admission committee. Students who are assigned an advisor will either confirm that this individual will remain in this role or identify a different advisor as early as possible and before core requirements are completed. Once an advisor has been selected, each student, in consultation with the advisor, will select no fewer than four additional members of the Graduate Faculty to complete the committee. This committee will be chaired by the advisor.

**Examination Structure**
The Ph.D. student must demonstrate satisfactory performance on a qualifying written examination, comprehensive oral examination, research proposal defense, and the production and formal defense of a dissertation that describes original research results. The requirements described here are in addition to the University-wide requirements for the Ph.D. degree described in the Graduate College Manual of Rules and Regulations, Section XII.

Each student must pass the dissertation defense within five years of the comprehensive oral examination, but no sooner than the term following this examination. A student’s proposal defense and comprehensive oral examination will typically be held during a single meeting of the committee. The structure and evaluation of the final examination follows the procedures outlined in the Graduate College Manual of Rules and Regulations, Section XII(O). The examination committee must include a member of the Graduate Faculty selected from outside the student's subprogram.

The dissertation can be structured as a traditional manuscript, or as a set of three or more journal articles with introductory and concluding sections that place the work in the broader context of related disciplines and literatures.

**M.S. Degree at Comprehensive Examination**
Students not already holding a University of Iowa M.S. degree may request that an M.S. in Geoinformatics be granted at the comprehensive exam. The M.S. degree is normally awarded upon successful completion of the comprehensive exam. Students who fail to pass the comprehensive exam may complete the requirements of a non-thesis M.S. (see section 4.3).

**Petitions**
Students may petition the IGPI Advisory Council for deviations from the requirements outlined here.

**Benchmarks**
Students will be considered to be making satisfactory progress toward their degree by meeting the following benchmarks: