Information Science Handbook

For more information regarding IGPI, please visit informatics.uiowa.edu or refer to the Interdisciplinary Graduate Program in Informatics Handbook.
# Table of Contents

Subprogram Description and Mission ........................................................................................................ 3

Program Requirements ................................................................................................................................... 4

Ph.D. Program ............................................................................................................................................... 4

  Ph.D. Guidelines and Milestones ................................................................................................................ 4

  Qualifier .................................................................................................................................................... 4

  Comprehensive Exam ............................................................................................................................... 5

  Proposal Defense .................................................................................................................................. 5

Final Oral Defense ........................................................................................................................................ 6

Ph.D. Outline for Plan of Study .................................................................................................................... 6

Core Courses ............................................................................................................................................... 6

Electives ..................................................................................................................................................... 7

Master of Science Program .......................................................................................................................... 9

Master of Science Guidelines and Milestones ............................................................................................. 9

M.S. Final Exam Procedures (with and without thesis) ............................................................................. 9

M.S. Outline for Plan of Study .................................................................................................................... 10

Certificate in Informatics ............................................................................................................................. 10

Certificate Outline for Plan of Study .......................................................................................................... 10
Subprogram Description and Mission

**Information Science** is the study of the acquisition, structuring, management, retrieval and dissemination of information in a variety of forms and contexts and the distillation of that information into knowledge. In the last decade, information science has had a profound impact upon society, opening to the public broad avenues of access to information previously available only to those with advanced training.

The primary mission of the Information Science subprogram of the Interdisciplinary Graduate Program in Informatics (IGPI) is to:

1. Train information science researchers for academia, industry, and research institutes, and
2. Train individuals aspiring to become leaders and visionary administrators responsible for effectively involving information and computational systems.

The Information Science subprogram represents an inherently multidisciplinary field with a strong computational nature, offering training in the application and development of computational methods addressing a variety of fundamental problems in Information Science. It also provides sufficient flexibility so that students with prior training in related fields (e.g., computer science, library and information science, linguistics, management science) may establish an essential foundation in the key areas. Students with academic backgrounds in other fields can establish a foundation in information science by completing a short sequence of preliminary coursework.
Program Requirements

Ph.D. Program

Please check the Manual of Rules and Regulations of the University of Iowa Graduate College for a complete description of the Ph.D. guidelines and requirements of the Graduate College. 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.

The Information Science subprogram Ph.D. requires a total of 72 semester hours beyond the bachelor's degree, with 18 semester hours satisfying the Certificate in Informatics (Information Science).

The remaining 54 semester hours should be selected, in consultation with the student's advisory, from disciplinary courses relevant to the student's particular Information Science focus.

The Ph.D. also requires satisfactory performance on the comprehensive exam, and the production and formal defense of a dissertation that describes original research results. Students not already holding a University of Iowa M.S. degree may request that one be granted at the comprehensive exam. The M.S. degree is normally awarded upon successful completion of the comprehensive exam, but may also be awarded even if the student does not pass the exam, at the examination committee's discretion and dependent on the student having met the requirements for the M.S.

Every Ph.D. student must have a faculty advisor with an appointment in the Information Science program. Upon admission, each student is assigned a temporary academic advisor. During their first year in the program, it is expected that the student will choose a faculty member whose research interests align with their own to serve as academic and research advisor, and chair of the student's thesis committee. The advisor / advisee relationship requires the consent of both parties and can be terminated by either. It is required that a student will complete a Plan of Study form (see appendix) in consultation with his/her advisor every semester, and submit the completed form to the IGPI office for approval. The Plan of Study form can also be downloaded from our website at: http://informatics.grad.uiowa.edu/information-science/curriculum.

Ph.D. Guidelines and Milestones

Qualifier

- Complete, at latest, by fall of YR 02
- Minimum committee of 3 to 5 professors, including the advisor
- Format: Research or project paper with a presentation – pass or fail
The student will conduct a small-scale research project and present this to the committee. As an example the research project could replicate work done in a paper of interest optionally with a few extensions. This milestone is designed to ensure that the student starts early in gaining research experience. It is also to ensure that the student has the potential to conduct doctoral level research. The student may retake the qualifier but needs to do so successfully by the next semester.

Comprehensive Exam
- Complete, at latest, by fall of YR 03 (approximately), allowing flexibility to accommodate scheduling of specific course(s)
- Format: A comprehensive review paper and a presentation
- Committee: Minimum of 5 professors, of which at least two are affiliated with IGPI
- Note: This examination is equivalent to the University’s requirement of a comprehensive exam.

The student will conduct a comprehensive review of the literature in the sub-area of interest. The review must convey sufficient knowledge of the sub-area’s breadth and depth. It must also include an outline of a few open research problems in the sub-area. The intent is to have this review document and the associated sub-area form the basis of the student’s continued doctoral research. The review document must be circulated to the committee at least 1 week (preferably 2 weeks) before the comprehensive exam date. On the exam date, the student is expected to make a presentation of the review to the committee.

Grading will be either pass or fail. The student may retake the exam, but needs to do so successfully by the following semester.

Students not already holding a University of Iowa M.S. degree may request that one be granted at the comprehensive exam. The M.S. degree is normally awarded upon successful completion of the comprehensive exam, but may also, at the examination committee’s discretion, be awarded even if the student does not pass the exam.

Proposal Defense
- Summer/Fall YR 04
- Format: Written proposal and presentation
- Committee: Minimum of five professors, of which at least two are affiliated with IGPI

The student will present a proposal to the committee a minimum of two weeks prior to the date of the proposal defense. Generally this will be in the form of two chapters: first a literature review, and second an outline of proposed research. The proposal presentation will emphasize an overview of the background research with most of the presentation time used to outline the planned research. This opportunity is designed so
that the committee and the student agree on the research required for completion of Ph.D.

**Final Oral Defense**

- Format: Written thesis and presentation
- Committee: Minimum of five professors, of which at least two are affiliated with IGPI

The student will present a complete thesis to the committee a minimum of two weeks prior to the date of the thesis defense. The student will motivate the research, present key findings and conclusions, and offer a critical inquiry of different facets of the research.

In addition to the formal examination process, students in the Ph.D. program are evaluated on a yearly basis to ensure satisfactory academic progress is being made. By September 15th, each student and his/her advisor are required to submit an evaluation assessment of the student’s progress, outlining past year accomplishments and plans for the current year, including Ph.D. milestones. The Advisory Board reviews these summaries and sends each student a letter summarizing his/her status in the program. Students failing to make satisfactory progress are expected to correct any deficiencies and move to the next milestone within one year; failure to do so will result in dismissal from the program.

**Ph.D. Outline for Plan of Study**

**Core Courses** (18 semester hours):

- Introductory (3 s.h.)
  
  CS:3110  Introduction to Informatics (3 s.h.)

- Programming (3 s.h.)
  
  CS:3210  Programming Languages and Tools (3 s.h.)

- Text Analytics (3 s.h.)
  
  CS:4440  Web Mining (3 s.h.) or
  CS:4980  Topics in Computer Science II (3 s.h.) or
  SLIS/IGPI:6120 Natural Language Processing (3 s.h.)

- Data Mining
  
  MSCI:6421  Knowledge Discovery (3 s.h.) or
  CS:6412  Knowledge Discovery & Data Mining (3 s.h.)
Databases (3 s.h.)
   SLIS:6100 Database Systems (3 s.h.) or
   MSCI:6200 Database Analysis and Design (3 s.h.) or
   CS:4400 (22C:144) Database Systems (3 s.h.)
   (Note: MSCI:9230 Database Systems is NOT an option)

Probability & Statistics (3 s.h.)
   STAT:3120 Probability and Statistics (3 s.h.)
   POLI:5001 Introductory Methodology (Note: This is a 4 s.h. course)

The remaining 54 semester hours of courses will be selected in consultation with the student’s advisor with the objective of designing a balanced program of study relevant to the student’s particular information science focus. The Information Science subprogram of the Informatics program will maintain an approved list of courses that may be used as a guide. Following is a preliminary list of approved elective courses.

Please note: Students wishing to pursue an independent study (IGPI:5015, IGPI:6515 or IGPI:6510) with a University of Iowa faculty member may refer to the Independent Study guidelines on the Informatics website.

Electives (54 semester hours)
   CS:4460 Introduction to Computational Linguistics (3 s.h.)
   CS:5350 Design and Analysis of Algorithms (3 s.h.)
   CS:4980 Topics in Computer Science II (3 s.h.)
   CS:4440 Web Mining (3 s.h.)

IGPI:5015/IGPI:6515 Independent Study (ARR) (Note: Formal proposal and permission of overseeing faculty member required prior to registering for class; contact IGPI program coordinator to obtain section number.)
IGPI:6510 Readings in Informatics (ARR) (Note: Formal proposal and permission of overseeing faculty member required prior to registering for class; contact IGPI program coordinator to obtain section number.)

MSCI:6190/SLIS:6190 Knowledge Management (3 s.h.)
MSCI:6200 Database Analysis and Design (3 s.h.)

SLIS:5200 User Education: Multimedia (3 s.h.)
SLIS:6270 Electronic Publishing (3 s.h.)
SLIS:6140 Digital Environments (3 s.h.)
SLIS:6380 Hypertext Systems (3 s.h.)
SLIS:6160 Search and Discovery Systems (3 s.h.)
SLIS:5900 Health Informatics I (3 s.h.)
SLIS:5910 Health Informatics II (3 s.h.)
SLIS:6490 Information Policy (3 s.h.)

STAT:3510 Biostatistics (3 s.h.)
STAT:3120 Probability and Statistics (3 s.h.)
STAT:3100 Introduction to Mathematical Statistics I (3 s.h.)
STAT:3101 Introduction to Mathematical Statistics II (3 s.h.)
STAT:3200 Applied Linear Regression (3 s.h.)
STAT:4100 Mathematical Statistics I (3 s.h.)
STAT:4101 Mathematical Statistics II (3 s.h.)
STAT:5200 Applied Statistics I (4 s.h.)
STAT 5300 Computing in Statistics (3 s.h.)
**Master of Science Program**

Please check the [Manual of Rules and Regulations of the Graduate College](https://informatics.grad.uiowa.edu/information-science) for a complete description of the M.S. guidelines and requirements of the University of Iowa Graduate College. The requirements described here are in addition to the university-wide requirements for master's degrees.

The M.S. program in the Information Science subprogram requires a completion of a minimum of 32 course semester hours beyond the bachelor's degree with at least 18 of the 32 hours satisfying the requirements of the informatics certificate.

Students are also required to successfully complete a master’s final examination as outlined in The Manual of Rules and Regulations of the Graduate College, Sections X.H. - X.J.

**Master of Science Guidelines and Milestones**

**M.S. Final Exam Procedures (with and without thesis)**

The structure and evaluation of the master's final examination will follow the procedures outlined in the [Manual of Rules and Regulations of the Graduate College](https://informatics.grad.uiowa.edu/information-science), Sections X.H. through X.J. Additional exam requirements are identified below.

1. The student will set up a committee of at least 3 UI faculty members who are sufficiently familiar with his/her coursework, etc.

2. A meeting will be set up during which the student is asked to make a brief 15 to 20 minute presentation that summarizes the knowledge acquired in the program. The student’s presentation should encompass at least a few courses; as an example, the student could interconnect term projects completed in different courses of the program of study. The presentation must demonstrate aspects such as coherence of ideas and connections to the field.

3. The student’s presentation will be followed by a 10 to 15 minute question answering session.

4. Please also refer to the Graduate College Guidelines for further details on this final exam.
M.S. Outline for Plan of Study

Students will complete the same 18 semester hours of core courses as for the Ph.D. in Information Science for the Interdisciplinary Graduate Program in Informatics (IGPI). Please see the Core Courses listed in the previous Ph.D. section, and note that M.S. students may take MSCI:9230 Database Systems as their database course.

The remaining 14 semester hours may be selected from the list of Electives identified under the previous Ph.D. section, or they may be selected from outside this list in consultation with the advisor and with the approval of the Information Science subprogram committee.

Certificate in Informatics

The Certificate in Informatics is open to graduate students in good standing who wish to complement their own disciplinary studies with foundational and applied knowledge in information science.

Students must complete a minimum of 18 semester hours for the Certificate. These include 9 semester hours in Informatics Core Courses, and 9 semester hours of specified coursework under a cognate area selected in consultation with the student’s academic advisor. Certificate students may not use the required courses from their major program of study to satisfy core Informatics Certificate requirements.

Note that only 9 semester hours of core coursework (Foundations of Informatics) may be shared between the Certificate and either the M.S. or Ph.D. Information Science (IGPI) plan of study. That is, the Certificate requires 9 semester hours of coursework that is not included in either the M.S. or Ph.D. plan of study. This applies to students pursuing the certificate prior to or concurrent with the M.S. or Ph.D. degrees.

Certificate Outline for Plan of Study

Core Courses in Foundations of Informatics (9 semester hours)

Certificate students must complete 3 semester hours in each of areas a.), b.), and c.), below:

a.) Introductory Informatics Coursework (3 s.h.)
   CS:3110 Introduction to Informatics (3 s.h.)
b.) Programming Coursework (3 s.h.)
   CS:3210 Programming Languages and Tools (3 s.h.)

c.) Data Handling Coursework (3 s.h.)

   Certificate students may choose from the following data handling coursework alternatives:

   BIOS:5110 Introduction to Biostatistics (3 s.h.)
   CS:6412 Knowledge Discovery & Data Mining (3 s.h.)
   CS:4400 Database Systems (3 s.h.)
   CS:4440 Web Mining (3 s.h.)

   MSCI:9230 Database Systems (3 s.h.)
   MSCI:6800 Knowledge Discovery (3 s.h.)
   MSCI:6200 Database Analysis and Design (3 s.h.)

   SLIS:5200 User Education: Multimedia (3 s.h.)
   SLIS:6270 Electronic Publishing (3 s.h.)
   SLIS:6140 Digital Environments (3 s.h.)

   STAT:3510 Biostatistics (3 s.h.)
   STAT:3120 Probability and Statistics (3 s.h.)
   STAT:3100 Introduction to Mathematical Statistics I (3 s.h.)
   STAT:3101 Introduction to Mathematical Statistics II (3 s.h.)
   STAT:3200 Applied Linear Regression (3 s.h.)
   STAT:4100 Mathematical Statistics I (3 s.h.)
   STAT:4101 Mathematical Statistics II (3 s.h.)
   STAT:5200 Applied Statistics I (4 s.h.)
   STAT 5300 Computing in Statistics (3 s.h.)

Disciplinary Courses (9 s.h.)

   Certificate students will select disciplinary courses in appropriate cognate areas in consultation with his/her advisor.