



Proposal to the Senate Educational Policy Committee

*Please replace all text in italic with appropriate information before submitting your proposal.
Your entries should be in regular (not italic) font.*

PROPOSAL TITLE: Establish a New Master of Science in Information Management in the Graduate School of Library and Information Science (GSLIS)

SPONSOR: Allen Renear, Dean and Professor, Graduate School of Library and Information Science, 217-265-5216, renear@illinois.edu

COLLEGE CONTACT: Linda C. Smith, Professor and Associate Dean for Academic Programs, Graduate School of Library and Information Science, 217-333-7742, lcsmith@illinois.edu

BRIEF DESCRIPTION: To establish a Master of Science in Information Management

The Graduate School of Library and Information Science (GSLIS) seeks to establish a Master of Science in Information Management. GSLIS already offers an M.S. in Library and Information Science (accredited by the American Library Association) and a concentration in the campus-wide M.S. in Bioinformatics. A new M.S. degree will enable us to contribute to meeting the national need for well-prepared information professionals, remain competitive with other iSchools that offer multiple M.S. degrees, and more strongly support the Information and Technology theme identified in Visioning Future Excellence. The new degree will build on existing strengths in GSLIS, but will provide a separate degree program for those interested in information-intensive professional roles in a very broad range of sectors. The planned degree program will be offered on campus and online, drawing on the experience and infrastructure that already supports our online M.S. in library and information science (the LEEP enrollment option). The program will attract individuals from a variety of disciplines. It will require 40 hours of coursework, including three required courses (LIS 561 and two newly proposed courses, LIS 542 and LIS 543) and electives selected from a list of available courses (see Appendix A). The program will be self-supporting and will require no additional resources: its initiation will utilize existing faculty capacity and expansion will be supported by tuition revenue.

JUSTIFICATION:

With continuing growth in the ability to collect, transmit, transform, visualize, analyze, and store information our nation has a pressing need for a larger and better prepared information management workforce. At the same time the nature of information management is changing rapidly. Today success in this field requires “a deep understanding” of how we use, manage, analyze and distribute information.¹ Contemporary information management includes not only the analysis of human information needs and the design of services and systems, but also information presentation, information integration, taxonomy and ontology, techniques for extracting information from large quantities of data and text (text mining, data mining, and data analytics), preservation and “curation”, and more. Designing and managing the complex information environments of the future will require a robust professional education that is not only a preparation for the technological challenges of a rapidly changing field, but that ensures a full appreciation of the broader role of information in society.

The mission of our School is “. . .to lead the way in understanding the use of information in science, culture, society, commerce, and the diverse activities of our daily lives”. Although no single curriculum, discipline, or field can prepare students for the entire range of information professions, the Graduate School of Library and Information Science at the University of Illinois at Urbana-Champaign is uniquely positioned to offer a degree program that directly addresses the need for professional education in information management. GSLIS has high visibility as the #1 ranked program in library and information science, is a leader in online education, and is a founding member of the iSchools organization (<http://www.ischools.org>), which promotes “an interdisciplinary approach to understanding the opportunities and challenges of information management.” Most importantly, we have over the past 20 years developed a highly interdisciplinary faculty who have introduced many new courses to our curriculum (see Appendix B) . We have strengths in information retrieval, database design, ontologies, data curation, data analytics, text and data mining, digital libraries, knowledge management, human-computer interaction, interface design, social computing, privacy, information policy, and human information behavior.

Although our M.S. in Library and Information Science has provided us with a valuable platform in educating students for a wide range of information professions, this program is no longer well-suited to preparing students for all roles that involve advanced technologies. A separate degree program with independent requirements and identity is needed if we are to take full advantage of our faculty, curriculum, and reputation and help meet national needs. Many other LIS-based iSchools have come to the same conclusion and have created similar programs to complement their LIS degrees; these programs have been very successful.

The foundational orientation of the proposed degree is the interdisciplinary human-centered approach of information science. This approach emphasizes a deep understanding of the interplay of people, information, and organizations and reflects a professional commitment to advancing the well-being of society through the use of information. Opportunities for information professionals with this degree exist in government, industry, research centers, academe, and nonprofit agencies.

We already have the faculty, curriculum, and infrastructure needed to begin this program and will fund any additional needs from tuition income. We believe that with our experience, world-class faculty, infrastructure, and reputation the proposed degree program will soon be one of the most successful of its kind.

¹ Morello, Diane; The IT Professional Outlook: Where Will We Go From Here?, Gartner Research, https://www.ee.iitb.ac.in/~hpc/old_studs/hrishi_page/outlook/report.pdf p. 9.

Comparable programs at peer institutions

Like Illinois, many of the most prominent iSchools trace their roots to library and information science. In order to prepare graduates for a wider range of information professional careers some iSchools have attempted to broaden the scope of their single library and information science degree, and that has until now been our approach. However, most iSchools have added one or more additional M.S. degrees and that approach, which is the one we are taking here, has generally been more successful. For comparison, we describe three of the best established programs:

Syracuse University, School of Information Studies, *M.S. in Information Management*, 42 hours (<http://ischool.syr.edu/future/grad/im.aspx>)

The degree is designed to prepare students to respond to four basic challenges confronting organizations today:

Increasing the productivity and creativity of knowledge workers, managers and executives who work with information resources;

Evaluating, planning and deploying the effective use of information and communication technologies within organizations;

Developing corporate and government policies to maximize the benefits resulting from the widespread use of these technologies; and

Improving the strategic use and management of information resources in business, government, and non-profit organizations.

It is offered in both on-campus and online formats.

Students complete a primary core of 10 credits; a secondary core of 15 credits (6 credits in management approaches and strategies; 6 credits in technological infrastructure; and 3 credits in user information needs); electives; and a capstone course.

University of Maryland, College of Information Studies, *Master of Information Management*, 36 hours (<http://ischoolumd.edu/mim>)

The specific goals of the MIM program are to:

Prepare professionals for leadership positions that bridge the gap between technology-oriented staff, functional personnel, and management;

Address the growing need for skilled information professionals who can strategically manage information and technology assets to fulfill critical information needs in organizations;

Provide leadership in the information management field through the study of ethical, political, social, and technical issues related to information management in modern society;

Assist organizations in the formation of information policies, development and application of information systems and services, and the use of information management technologies and methods.

It is offered on the College Park and Shady Grove campuses of the University of Maryland.

Students complete a mix of required and elective courses, with the specific courses depending on their choice of one of 9 possible specializations: curation and management of digital assets, user interface/user experience, organizational and process analysis, data analytics, project management, strategic management of information, technology development and deployment, information management research, or individualized program plan.

University of Pittsburgh, School of Information Sciences, *M.S. in Information Science*, 36 hours (<http://www.ischool.pitt.edu/ist/degrees/msis-program.php>)

The 36 credits are distributed as follows:

Six credits in the Formal or Applied Foundations area

Eighteen credits in the Systems and Technology areas

Six credits in the Cognitive Science or Cognitive Systems areas.

Six credits of electives.

It is offered on campus. Possible areas of specialization include big data analytics, human-centered computing, database and web systems, information assurance and security, geoinformatics, and telecommunications and distributed systems.

Structure of the Proposed M.S. in Information Management

A strength of our existing M.S. in Library and Information Science is the opportunity for students to individualize their program of study, with a small number of required courses (two) and a wide range of electives available. We are applying this successful approach to the new program as well. The M.S. in Information Management will have three required courses, with the additional requirement that a student must have competency in at least one programming language. The required courses are:

LIS 542 Data, Statistical Models and Information,
LIS 543 Sociotechnical Information Systems,
LIS 561 Information Modeling.

The range of possible elective courses is provided in Appendix A. Potential areas of emphasis include:

- curation and management of digital assets, including data
- user interface/user experience
- socio-technical data analytics (text and data mining)
- document modeling and processing
- privacy of information; trust and security
- information ethics and policy

Graduates will be equipped to lead collaborative projects in information-intensive professional environments, from government institutions to corporate settings.

Many of the courses that will become a part of the program already are offered regularly online and we have the infrastructure in place to support the development and delivery of more courses each semester.

BUDGETARY AND STAFF IMPLICATIONS:

1) Resources

- a. How does the unit intend to financially support this proposal?

Faculty and staff needed to start the program are already in place as is the necessary technical infrastructure to support online courses. As enrollment grows, tuition income will provide the resource base needed for program expansion.

- b. How will the unit create capacity or surplus to appropriately resource this program? If applicable, what functions or programs will the unit no longer support to create capacity?

Faculty members will teach the needed courses on-load; we already have the faculty capacity to offer the needed courses.

- c. Will the unit need to seek campus or other external resources? If so, please provide a summary of the sources and an indication of the approved support.

No additional campus or external resources will be sought.

- d. Please provide a letter of acknowledgment from the college that outlines the financial arrangements for the proposed program.

[Letter appended from Dean Allen Renear]

2) Resource Implications

- e. Please address the impact on faculty resources including the changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc.

The addition of this degree program will allow us to better use existing faculty resources. We anticipate an increase in class size (with teaching assistant support if needed) and student-faculty ratios, but not in teaching loads.

- f. Please address the impact on course enrollment in other units and provide an explanation of discussions with representatives of those units. (A letter of acknowledgement from units impacted should be included)

Our goal is to recruit new students into this program who would not otherwise pursue a degree (either on-campus or online) at Illinois. Thus we do not anticipate a negative impact on enrollments in degree programs in other colleges. We have the capacity to offer all courses needed for the program, so we do not anticipate placing teaching demands on other units.

To support coordinated coverage in programs related to the information sciences at the University of Illinois at Urbana-Champaign, GSLIS has discussed this proposal with the Dean of the College of Engineering, the Dean of the College of Business, the head of the Department of Computer Science, the head of the Department of Business Administration (see letters of endorsement, attached). GSLIS will continue to collaborate with these units in order to ensure adequate coverage, differentiation, and strategic resource sharing.

In particular GSLIS will coordinate with the Department of Business Administration (BADM) to maintain a clear differentiation in both nature and appearance between current and future programs, specializations, and concentrations in the two units, in particular with BADM's Masters of Science in Technology Management (MSTM) program, which currently has concentrations in both Business Data Analytics and Information Technology & Control. The focus of the MSTM is on "business education with a technology focus" (<http://www.ms-tech.illinois.edu/>, retrieved December 23, 2014). In contrast, the GSLIS MSIM does not provide business education or emphasize business applications, the focus of the MSIM is on information management education and reflects a traditional emphasis on educational,

cultural, and scientific institutions, government agencies, and community organizations. The MSTM and MSIM curricula are consequently quite different. None of the MSTM “core business courses” are similar to MSIM required courses, with the possible exception of the statistics courses (*Statistics for Management Decision Making* (BADM572) and *Data, Statistical Models, and Information* (LIS542), where there is some overlap, but differences as well. Similarly none of the MSTM “management of technology” courses are similar to MSIM electives, except for the project management (BADM 589 and LIS590MG) courses, and here there are differences also.

To ensure that these market and curricular differences in the two programs are maintained and are evident to potential applicants, GSLIS will not develop any independent concentration, specialization, or track in the MSIM (or in any other GSLIS program) that focuses specifically on business and will not offer any courses on business or business management. In addition GSLIS will not emphasize business or marketing applications for the MSIM (or any other GSLIS program), use the phrases “business analytics” or “marketing analytics” in the main text of our promotional materials or program documentation, and will not promote the MSIM as a business degree.*

GSLIS recruiters will advise potential applicants to consider applying to the BADM MSTM when it seems that a potential applicant's interests would be better served by that program. Similarly BADM recruiters will advise potential applicants to the MSTM to consider applying to GSLIS MSIM program when it seems that the potential applicant's interests might be better served by that program.

GSLIS will also provide a prominent link (via an icon) to the BADM MSTM program in its online description of the MSIM program and suggest that potential applicants interested in information management in the context of a business education should consider the MSTM program. BADM will also provide a prominent link (via an icon) to the GSLIS MSIM program in its online description of the MSTM program and suggest that potential applicants who are interested in an information management education but not a business education should consider the GSLIS MSIM program.

The dean of GSLIS, the head of BADM, and the head of Computer Science have agreed to meet annually to discuss the coordination of programs in their units.

* These agreements do not restrict GSLIS from teaching courses in areas such as competitive intelligence (LIS590AC), business information (LIS530E), information service marketing (LIS590ISM), information consulting (LIS590IC), strategic information management (LIS590ST), entrepreneurial information technology design (LIS490IT), management of information centers (LIS505), or systems analysis and management (LIS453), or maintaining advising documents in areas such as business research and competitive intelligence. None of these courses have substantial overlap in content with courses taught in the MSTM program (<http://webdocs.lis.illinois.edu/advising/Research%20and%20Analysis.pdf>).

[Letters appended from the Department of Business Administration, the College of Business, the Department of Computer Science, and the College of Engineering.]

- g. Please address the impact on the University Library (A letter of estimated impact from the University Librarian must be included for all new program proposals. If the impact is above and beyond normal library business practices, describe provisions for how this will be resourced.)

We have worked closely with the University Library to ensure strong support for our courses, both on-campus and online. We do not anticipate that this proposed program will place new, unique demands on either collections or personnel.

[Letter appended from Dean John Wilkin]

- h. Please address the impact on technology and space (e.g. computer use, laboratory use, equipment, etc.)

We anticipate having space available in our building at 501 E. Daniel to accommodate courses scheduled on-campus. The technology infrastructure (Moodle, Blackboard Collaborate, servers maintained by our information technology staff) can readily accommodate more scheduled online courses.

For new degree programs only:

- 3) Briefly describe how this program will support the University's mission, focus, and/or current priorities. Include specific objectives and measurable outcomes that demonstrate the program's consistency with and centrality to that mission.

Information and Technology was one of six theme areas identified in Visioning Future Excellence in Spring 2013

(<http://oc.illinois.edu/visioning/reports/InformationandTechnologyVFE.pdf>).

This report notes the existing leadership on campus in such areas as data science and observes that "our campus strives to be at the leading edge of offering educational opportunities to students through a variety of new modalities." To the list of programs identified, we seek to fill a gap with a new M.S. in information management. Likewise the January 2014 report prepared for the Research Park on "Identification of Technology Clusters for Economic Development"

(<http://strategicplan.illinois.edu/documents/Technology%20Cluster%20Development.pdf>)

recommends a focus on Data Analytics and Management, and Computing as one of three clusters with opportunities for growth. The report notes (p. 4): "A critical mass of assets, talent, innovation, activity and support are present and form a strong foundation, and must continue to grow beyond the current level."

A new M.S. in information management can contribute to this effort. One of the interdisciplinary working groups appointed by the Provost and OVCR is devoted to Computation, Data, and Information (<http://research.illinois.edu/about/committees.cfm>). While the emphasis of their work is on research (e.g., working with OVCR staff to create strong coherent external communications that present Illinois as a world leader in computation, data and information), leadership in research should be coupled with well-developed educational offerings in data and information to enhance impact.

GSLIS has been successful in recruiting women and members of underrepresented groups into its M.S. in Library and Information Science. We intend to continue and expand that success in the proposed program, advancing the inclusion of women and members of underrepresented groups in STEM fields, and in this way contributing to the University's inclusion agendas.

To ensure sustainability the new program will be self-supporting, in accord with initiative IVc) of the 2014 University Strategic Plan: "... actively explore additional revenues through self-supporting, online and continuing education programs".

- 4) Please provide an analysis of the market demand for this degree program. What market indicators are driving this proposal? What type of employment outlook should these graduates expect?

We see growth opportunities across academe, industry, government, and nonprofit agencies seeking individuals with knowledge and skills in such areas as big data, digital asset management, information analysis, competitive intelligence, digital publishing, project management, database design, web applications, information design and visualization, and user experience. The Bureau of Labor Statistics (BLS) ranks the growth of most information management related occupations as faster than average (e.g. database administrators) or “much faster than average” (e.g. systems analysts). In a 2013 article titled “Working with Big Data” (<http://www.bls.gov/opub/ooq/2013/fall/art01.pdf>) BLS notes that “Workers who use big data are employed by many kinds of institutions and in many different industries: government, businesses, financial institutions, healthcare, scientific research facilities, colleges and universities, and others. The collection and use of big data continues to expand in all of these” (p. 8); and “A major impediment to the widespread use of big data is the lack of workers with the appropriate training and skills” (p. 9).

We have had a data curation specialization in place for several years; a recently completed alumni survey demonstrates success in job placement and high career satisfaction. Our experience with the data curation specialization also emphasizes the rapid emergence of new job titles and configurations of responsibilities—many of our alumni are taking positions that are newly defined in their organizations in response to emerging needs for data curation. We anticipate a similar situation in other areas of specialization within information management.

Finally, other iSchools with degrees similar to this one (including the University of Washington, University of Maryland, University of Pittsburgh, Syracuse University) report high applications and strong enrollments.

- 5) What resources will be provided to assist students with job placement?

GSLIS has already enhanced our career services staffing to provide better support to graduates of our degree programs. In addition we can assist graduates in networking with alumni and with members of our Corporate Round Table.

- 6) If this is a proposed graduate program, please discuss the program’s intended use of waivers. If the program is dependent on waivers, how will the unit compensate for lost tuition revenue?

This program will be *self-supporting*. Students may not accept waiver-generating assistantships but statutory waivers will be honored.

DESIRED EFFECTIVE DATE: August 16, 2015

STATEMENT FOR PROGRAMS OF STUDY CATALOG: *(All proposals must include either a new or revised version of the entry in the Programs of Study Catalog, if applicable. Entries will be published as approved by the Senate. Future changes in the statement for Programs of Study Catalog which reflect changes in the curriculum, must go through the normal review process at the appropriate levels.)*

[See <http://catalog.illinois.edu/graduate/graduate-majors/library-info-sci/> and <http://catalog.illinois.edu/graduate/graduate-majors/library-info-sci/#masterstext> for the current entries.]

Overview

<http://catalog.illinois.edu/graduate/graduate-majors/library-info-sci/>

Library and Information Science

Overview

www.lis.illinois.edu

Dean of the School: Allen H. Renear
501 East Daniel Street
Champaign, IL 61820-6211
(217) 333-7197, (800) 982-0914 (within the U.S.)
E-mail: lis-apply@illinois.edu

Major: Library and Information Science
Degrees Offered: M.S., C.A.S., Ph.D.
Graduate Concentrations: Digital Libraries (C.A.S. only), [Writing Studies](#) (Ph.D. only)

Major: Information Management
Degrees Offered: M.S.

Major: Bioinformatics
Degrees Offered: M.S.
Graduate Concentration: Library and Information Science

Online Programs: Library and Information Science
Degrees Offered: M.S., C.A.S.
Graduate Concentrations: Digital Libraries (C.A.S. only)

Online Program: Information Management
Degrees Offered: M.S.

Joint Degree Program: Library and Information Science and African Studies
Degrees offered: M.S. and M.A.

Graduate Degree Programs

The Graduate School of Library and Information Science (GSLIS) offers programs of study leading to the Master of Science (M.S.), the Certificate of Advanced Study (CAS), and the Doctor of Philosophy degrees. *Three* Master of Science (M.S.) degrees are available. The M.S. in Library and Information science (L.I.S.) prepares students for professional careers in all types of information organizations, including libraries. *The M.S. in Information Management prepares students for professional roles in the design and management of information systems and services in organizations in a range of sectors.* The GSLIS concentration of the campus-wide M.S. in Bioinformatics program emphasizes multidisciplinary skills that are required for a career developing and managing information systems for the biological community. The C.A.S. program provides the opportunity

1. to study an aspect of library and information science in greater depth than is possible in the M.S. program,
2. to refresh and upgrade one's professional training several years after completing the M.S. program, or
3. to redirect one's career into a different area of library and information science.

K-12 Library Information Specialist Licensure is available in conjunction with both the M.S. in L.I.S. and C.A.S. The Ph.D. is a research degree program.

Admission

Applicants are admitted in the fall, spring, and summer semesters. The general admission requirements of the Graduate College apply. Consideration is also given to language study and computer skills, relevant work experience, letters of reference, and evidence of leadership. International students must score at least 620 on the paper-based Test of English as a Foreign Language (TOEFL) (260 on the computer-based test; 104 on the iBT version); or 7 on each section of the IELTS. The M.S. in Bioinformatics requires a strong background in information science including undergraduate-level computing and mathematics. The C.A.S. requires a master's degree in library and information science and a grade point average of at least 3.0 (A = 4.0) in the master's program. K-12 admission requires admissions into the M.S. program and a passing score on the Illinois Test of Academic Proficiency.

K-12 Library Information Specialist Licensure

The K-12 Licensure option allows students to meet the requirements for the M.S. or C.A.S in L.I.S. while also pursuing the courses and training needed for state teacher licensure. Courses in library and information science as well as education, practicum, and student teaching are required for licensure. The requirements for the Library Information Specialist licensure were approved by the Illinois State Board of Education (ISBE) in 2001. K-12 licensure may be pursued on-campus or via the LEEP online scheduling option.

Graduate Teaching Experience

Although teaching is not a general Graduate College requirement, experience in teaching is considered an important part of the graduate experience in the Ph.D. program for those interested in faculty careers.

Facilities and Resources

Among the major areas of faculty research are:

- community informatics
- data curation
- digital libraries
- information retrieval
- information organization
- information history, economics, and policy
- librarianship and literature for youth
- special collections

The School's Center for Informatics Research in Science and Scholarship (CIRSS) conducts research on information problems that impact scientific and scholarly inquiry. The Center for Children's Books (CCB) provides a review and research collection of the newest literature for children and young adults. The Center for Digital Inclusion fosters inclusive and sustainable societies through research, teaching, and public engagement about information and communication technologies (ICT) and their impacts on communities, organizations, and governments. The Communications Office publishes the refereed journal, *Library Trends*, as well as The Bulletin of the Center for Children's Books. The staff of each of these units is available to students and faculty for consultation and guidance. A computer network with Internet connectivity is integral to teaching and learning activities. The University Library provides a vast reservoir of resources for all types of study and research in library and information science.

The School maintains an ongoing commitment to continuing education through conferences, institutes, workshops, and course offerings.

Financial Aid

Financial aid may be available from the School, the University Library, and elsewhere in the University in the form of graduate assistantships, teaching assistantships, research assistantships, and hourly paid work. Area libraries may provide preprofessional or hourly positions. Also, the School offers a limited number of fellowships for which doctoral students tend to be favored over C.A.S. and master's degree students. Students in the joint program that do not hold a FLAS fellowship are eligible for, but not guaranteed, fellowship or assistantship support in the semesters in which they are enrolled in GSLIS. Any assistantship awarded to these students provides a waiver of the base in-state tuition and service fee as well as a stipend. Non-Illinois residents must pay the difference between in- and out-of-state tuition.

Master of Science in Information Management

<http://catalog.illinois.edu/graduate/graduate-majors/library-info-sci/#masterstext>

Master of Science in Information Management

The Master of Science (M.S.) in Information Management prepares students for professional roles in the design and management of information systems and services in organizations in a range of sectors. Areas of specialization include data analytics (text and data mining), data curation, information retrieval, database design, ontologies, digital publishing, interface and user experience design, information policy, and information security. Two scheduling options are available to students pursuing the M.S. in Information Management. The on-campus option serves students who are in residence at Urbana-Champaign, as well as part-time, commuting students. The online scheduling option is an online education option that uses the Internet and other information technologies for delivery.

Degree Requirements

Master of Science, Information Management

Required Courses:	Required Hours
LIS 561, LIS 542, LIS 543	12
Research/Project/Independent Study	max 4
Total Hours	40

Minimum Hours Required within the Unit 28
Minimum 500-level Hours Required Overall 12

Other Requirements:
Competency in at least one programming language.

Minimum GPA: 2.75

The M.S. may be completed on-campus or online.

BACK MATTER

APPENDIXES

Appendix A: Curriculum Plan

Appendix B: Faculty Resources

SYLLABUS FOR REQUIRED EXISTING COURSE:

LIS561LE: Information Modeling

PROPOSALS FOR NEW REQUIRED COURSES

LIS542: Data, Statistical Models, and Information

LIS543: Sociotechnical Information Systems

CLASSIFICATION REQUEST FORM

RESPONSES TO CLASSIFICATION QUESTIONS

LETTERS

GSLIS Dean (Financial Arrangements)

Department of Computer Science

College of Engineering

Department of Business Administration

College of Business

University Library (Impact)

Appendix A Curriculum Plan

40 hour degree

Demonstrate competency in at least one programming language

Three required courses:

LIS 542 Data, Statistical Models and Information (4 credit hours)
[see attached New Course Outline]

LIS 543 Sociotechnical Information Systems (4 credit hours)
[see attached New Course Outline]

LIS 561 Information Modeling (4 credit hours)

Electives chosen from existing offerings:

LIS 456 Information Storage and Retrieval (4 credit hours)

LIS 490DB Introduction to Databases (4 credit hours)

LIS 490GI Geographic Information Systems (4 credit hours)

LIS 490IT Entrepreneurial IT Design (4 credit hours)

LIS 490MU Museum Informatics (4 credit hours)

LIS 490ST Community Informatics Studio (4 credit hours)

LIS 503 Use and Users of Information (4 credit hours)

LIS 518 Community Informatics (4 credit hours)

LIS 556 Implementation of Information Storage and Retrieval Systems (4 credit hours)

LIS 560 Digital Libraries (4 credit hours)

LIS 562 Metadata in Theory & Practice (4 credit hours)

LIS 586 Digital Preservation (4 credit hours)

LIS 590AD Sociotechnical Data Analytics (4 credit hours)

LIS 590AG Evidence-Based Discovery (4 credit hours)

LIS 590BEL Building Broadband Communities (4 credit hours)

LIS 590CW Computer-Supported Cooperative Work (4 credit hours)

LIS 590DC Foundations of Data Curation (4 credit hours)

LIS 590DH Digital Humanities (4 credit hours)

LIS 590DM Document Modeling (4 credit hours)

LIS 590DP Document Processing (4 credit hours)

LIS 590DT Data Mining (2 or 4 credit hours)

LIS 590ET Information Ethics (2 or 4 credit hours)

LIS 590II Interfaces to Information Systems (4 credit hours)

LIS 590IP Information Policy (4 credit hours)

LIS 590MG Project Management (4 credit hours)

LIS 590MT Informetrics (4 credit hours)

LIS 590NA Network Analysis (4 credit hours)

LIS 590OD Ontology Development (4 credit hours)

LIS 590PV Privacy in the Internet Age (4 credit hours)

LIS 590RO Representing & Organizing Information Resources (2 or 4 credit hours)

LIS 590SF Social Computing (4 credit hours)

LIS 590ST Strategic Information Management (4 credit hours)

LIS 590TC Thesaurus Construction (2 or 4 credit hours)

LIS 590TX Text Mining (4 credit hours)

LIS 590UMI Understanding Multimedia Information (4 credit hours)

Other courses as approved by the student's academic advisor.

Appendix B Faculty Resources

Masooda Bashir, Assistant Professor; PhD, Psychology, Purdue

Areas of expertise: The interface of IT, psychology, and society, especially how privacy, trust, and cognitive factors intersect from a psychological point of view with information technology.

Catherine Blake, Associate Professor and Associate Director, Center for Informatics Research in Science and Scholarship; PhD, Information and Computer Science, University of California, Irvine

Areas of expertise: Text mining, information synthesis, collaborative information behaviors, recognizing textual entailment, summarization, evidence-based discovery, meta-analysis, socio-technical systems.

Nicole A. Cooke, Assistant Professor; PhD, Communication, Information and Library Studies, Rutgers

Areas of expertise: Human information behavior, particularly in an online context, information literacy and instruction.

Jana Diesner, Assistant Professor; PhD, Computer Science, Carnegie Mellon

Areas of expertise: Social computing; computational social science; natural language processing; network analysis; machine learning; covert networks; covert information; socio-technical systems.

J. Stephen Downie, Professor and Associate Dean for Research; PhD, Library and Information Science, Western Ontario

Areas of expertise: Design and evaluation of information retrieval systems, including multimedia music information retrieval; the political economy of internetworked communication systems; database design; Web-based technologies.

David Dubin, Research Associate Professor; Ph.D., Information Science, Pittsburgh

Areas of expertise: The foundations of information representation and description; issues of expression and encoding in documents and digital information resources.

Miles Efron, Associate Professor; Ph.D., Information and Library Science, North Carolina

Areas of expertise: Information retrieval in emerging domains such as social media and large collections of digitized books; temporal (diachronic) issues in information retrieval; human interactions with information search and retrieval systems.

Jon Gant, Research Associate Professor and Director, Center for Digital Inclusion; PhD, Public Policy and Management, Carnegie Mellon

Areas of expertise: Electronic government, information technology, and organization design; social networks, knowledge management, and information technology; evaluation of broadband Internet; strategic management of information systems; and geographic information systems and geospatial technologies.

Les Gasser, Professor; PhD, Information and Computer Science, University of California, Irvine

Areas of expertise: Evolution and dynamics of information and networks; social analysis of information/communication technologies (ICTs); information in biological systems.

Lori Kendall, Associate Professor; PhD, Sociology, University of California, Davis
Areas of expertise: Personal archiving; online community and identity; social aspects of computing; research methodology; and gender and technology.

Emily Knox, Assistant Professor; PhD, Communication, Information and Library Studies, Rutgers
Areas of expertise: Intellectual freedom and censorship, and information ethics and policy.

Kathryn La Barre, Associate Professor; Ph.D., Information Science, Indiana
Areas of expertise: Knowledge organization and access systems; task analysis; facet analysis and faceted classification; classification and concept theory with a special focus on the interactions between theoretical and practical approaches to information discovery and access.

Bertram Ludäscher, Professor; Ph.D., computer science, Freiburg (Germany)
Areas of expertise: data and knowledge management, focusing on the modeling, design, and optimization of scientific workflows, provenance, data integration, and knowledge representation.

Jerome McDonough, Associate Professor; Ph.D., Library and Information Studies, Berkeley
Areas of expertise: Digital libraries; digital preservation and curation; digital humanities; metadata design; human-computer interaction and user interface design; socio-technical and participatory design approaches to information systems development.

Allen Renear, Professor and Dean; Ph.D., Philosophy, Brown
Areas of expertise: Ontologies for data curation and scientific publishing; logic-based analysis of scientific discourse; XML semantics; production and delivery workflows for scientific publishing; identity and change problems in digital object management.

Victoria Stodden, Associate Professor; J.D. and Ph.D., Statistics, Stanford
Areas of expertise: enabling reproducibility in computational science, including studying adequacy and robustness in replicated results, designing and implementing validation systems, developing standards of openness for data and code sharing, and resolving legal and policy barriers to disseminating reproducible research.

Carol Tilley, Associate Professor; Ph.D., Information Science, Indiana
Areas of expertise: Information seeking and use, and media literacy.

Vetle Torvik, Assistant Professor; Ph.D., Engineering Science, Louisiana State
Areas of expertise: Mathematical optimization; computational statistics; text and data mining; literature-based discovery; bioinformatics.

Michael Twidale, Professor; Ph.D., Computing, Lancaster (UK)
Areas of expertise: Computer supported cooperative work; collaborative technologies in digital libraries and museums; user interface design and evaluation; open source usability; information visualization; ubiquitous learning, social learning of technology, rapid prototyping and evaluation.

Kate Williams, Associate Professor, Ph.D., Information, Michigan
Areas of expertise: Community informatics, in particular the relationship between social networks, social capital, and the use of information and communications technology in low-income communities

CLEARANCES: (Clearances should include signatures and dates of approval. **These signatures must appear on a separate sheet.** If multiple departments or colleges are sponsoring the proposal, please add the appropriate signature lines below.)

Signatures:



Unit Representative:

Feb 14, 2015

Date:



College Representative:

Feb 14, 2015

Date:

Graduate College Representative:

Date:

Council on Teacher Education Representative:

Date:

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Administration

[My profile settings](#)**Syllabus**

This is the *syllabus*, a description of course content, objectives, policies, etc.
 For the schedule of topics and assignments see the main Moodle page.
 For the schedule of marked exercises see the *schedule of marked exercises*.

LIS561LE: Information Modeling

Syllabus

Graduate School of Library and Information Science
 University of Illinois at Urbana-Champaign
 Semester 1, 2013-2014
 Wednesday, 5:30-7:30pm CT
 Last Change: August 16, 2013

Instructors: Karen Wickett

- Email: wickett2@illinois.edu
- Skype: karen_wickett
- Office hours: Tuesdays 3:00-4:00 Central, also by appointment

About this document

This is the *syllabus* for LIS561, Information Modeling, (fall, 2013). It describes the content, objectives, policies, grading, and other such things. The schedule of topics and readings is on the main Moodle page. This syllabus is as long as it is because it covers material that would ordinarily be covered in the first and second classes, not only introducing the course administrative policies, but motivating and contextualizing the content as well. We don't have an opportunity to do this in real time, so we do it here.

Changes in the syllabus and schedule will be made throughout the course to respond to the needs of the class or for other reasons. Some minor changes in material weeks away may be made silently, but in most cases they will be noted in the change log, below. Beginning August 26th there will be email notification of any change that affects assignments or grading.

Change log**Description**

Brief Description: An introduction to the foundations of the information modeling methods used in current digital library applications as well as in information management in general. The specific methods considered are relational database design, conceptual modeling, markup systems, and ontologies. The basic concepts underlying these methods are, respectively, relations, entities, grammars, and logic. Implementations include relational database design, ER/EER/UML diagrams, XML markup languages, and RDF/OWL semantic web languages. First order logic is emphasized throughout as the foundational framework for information modeling in general, and for contemporary web-based information management and delivery systems (including semantic web technologies) in particular.

Objectives: Two sorts of students are anticipated and the course objectives are similar but slightly different for each group. In neither case is prior relevant knowledge assumed.

1. IML prepares students anticipating generalist responsibilities (as directors, managers, general staff, etc.) to be effective leaders in making decisions about the design, development, and evaluation of information systems, services, and policies, helping their organizations and communities deal with all aspects of the difficult technology challenges ahead.

2. IML prepares students anticipating careers as technology specialists to efficiently acquire and maintain superior information modeling skills throughout their careers and to play leadership roles in the design, development, and evaluation of information systems, services, and policies.

Consistent with the GSLIS goal of producing *leaders* in information science and not just competent professionals we focus on developing a deep understanding that will have long-term benefits and prepare students to engage the hardest problems facing organizations and society.

Of course IML alone cannot fully realize these objectives; it makes a partial contribution, focusing on the principles and concepts of information modeling. A partial contribution, but a necessary one: the connection between a deep understanding of information modeling concepts and the challenging information management problems facing us today is profound.

Strategy: After a unit on logic, which provides a general framework for understanding and evaluating other modeling methods, the course examines the major modeling approaches currently in use in information management: relational modeling, conceptual modeling, XML markup, and ontologies, focusing on underlying concepts and principles. The course is thus simultaneously a foundations course and a survey course. There are several important cross-cutting themes:

- Data independence through abstraction.
- The interdefinability of fundamental modeling constructs.
- Deep vs. superficial differences in modeling languages.
- The expressiveness vs. tractability tradeoff.
- The fundamental role of a very small set of inter-related concepts.

Analytical Description of Course Content

The course is divided into 5 units. The first unit introduces basic concepts from logic that are fundamental to understanding information modeling. The other four units each introduce an important information *modeling method* currently being used in digital libraries. These information modeling methods may be characterized with respect to five different features:

- *Implementations:* What sort of existing languages embody the method?
- *Underlying constructs:* What are the basic constructs that are fundamental to the method?
- *Apparent objects:* What kinds of things does the method appear to be "about"?
- *Typical objective:* What are the typical objectives of applications of this method?
- *Typical applications:* What are typical applications of this method?

The corresponding characterization of each unit would be:

Unit	Method	Implementations	Basic Underlying Constructs	Apparent Objects	Typical Objective	Typical Applications
1	Logic*	prolog FOL (SL, PL) RDF/OWL	propositions	facts	inferencing	expert systems
2	Relational Design	Relational databases	relations	data	representing data	metadata (e.g. online catalogues)
3	Conceptual Modeling	ER, EER, UML	entities, relationships	things	designing information systems	bibliographic relationships (e.g. FRBR)
4	Markup Systems	SGML/XML	grammars, (and graphs)	text	modeling text	web pages, digital texts, scholarly articles e.g.: HTML, TEI, NLM
5	Ontologies	RDF/OWL	entities, properties	the world	coordinating information system design; representing knowledge; inferencing;	scientific theories (e.g. the Gene Ontology)

*While logic is a modeling language, it is also, and more importantly for us, the framework for understanding all modeling languages.

The division is not as neat as it looks. First there is an intertwining of approaches. For instance, grammars are routinely used to define logical languages, and logical assertions can in turn define grammars. XML can serialize relations, ontologies, logics, and conceptual models, and tabular relations can in turn model XML hierarchies, as can logical assertions. In addition the distinctions are more social than conceptual. For instance, formal ontologies differ from conceptual modeling only in typical degree of expressiveness.

More on course objectives

As mentioned above two sorts of students are anticipated and the course objectives are slightly different for each. This is expanded on a bit more here. [Of course you may not identify exclusively with just one of these two groups, or you may think you do but be wrong about where you are going to end up, or you may be after some third thing. Doesn't really matter of course; the content will be relevant one way or another.]

Generalist professionals

The most important technology decisions in an organization, an industry, or a community are typically made by generalists, not specialists. In particular it is generalist managers and directors who approve technology strategy, write RFPs, accept proposals, negotiate contracts, hire and supervise specialists, formulate policy and procedures, adjudicate competing recommendations, vote on information processing standards, develop positions for professional societies, advise regulatory agencies, advocate nationally and internationally, and so on. Non-managerial generalists also make substantive contributions to these decisions. Technology specialists on the other hand rarely have the assigned responsibility, the right incentives, or a sufficiently broad understanding to make important technology decisions.

However in order for generalist leaders to make strategic decisions effectively they must have a deep understanding of the critical underlying concepts and principles of modern information management. This course aims to provide students anticipating generalist roles with that deep understanding. Given the importance and ubiquity of technology decisions, and the generally inadequate advice provided by local technology specialists, successful leadership without this knowledge is unlikely.

Technology professionals

For students anticipating roles as technology professionals (systems analysts, digital librarians, systems librarians, etc.) the objective is to prepare them to efficiently acquire and maintain superior information modeling skills throughout their careers, and to play a leadership role in the design, development, and evaluation of information systems, services, and policies.

Sometimes students in this category will already have prior practical experience or formal training in programming, database design, and content management, but will lack an understanding of the foundations. In fact too often some ability with software tools, programming, or content management creates the illusion of an understanding that does not exist. But without this deeper understanding it is not possible to develop high-function, reliable, interoperable systems at a reasonable cost to operate and maintain; nor is it possible to easily learn and understand new techniques; nor is it possible, most importantly, to play a useful leadership role in the development of technology services and policies.

The Connection (the sermon)

Many of the difficult technology-related problems we will encounter in the next ten years, as well as many of the missed opportunities, will be created by inadequately educated, but supremely self-confident, technology professionals working in concert with technologically ignorant and easily misled directors and managers. The result will be expensive, unreliable, inflexible, inequitable, low-function systems; flawed policies; biased standards; inadequate services; and missed opportunities. [If you are interested in social justice, note that these failures will particularly hurt the relatively marginalized: the marginalized, the poor, the disabled, non-western cultures, etc.]

There are several reasons for the unfortunate alliance of specialists and managers, including dysfunctional organizational design and the natural limitations of market forces. But also amongst these reasons is a profound and general ignorance of the simplest most fundamental concepts of contemporary information modeling, an ignorance that results in systems that create problems rather than seize opportunities. We want to put you on the right side in this struggle. Everyone makes consequential technology decisions these days, not just appropriately educated software engineers.

Relationship to other Courses

Prerequisites: No formal prerequisites other than LIS501 either previously or concurrently (or permission of the instructor). No special required skills other than the ability to learn simple symbolic languages without excessive anxiety.

Corequisites: If you have not already taken LIS501 you should be enrolled this semester.

Courses this course is a prerequisite for: This course is not a formal prerequisite for any other GSLIS course. However it is a good natural preparation for many courses, including, and especially, Systems Analysis and Management (LIS453), Data Administration Concepts and Database Management (LIS590X01), Document Modelling (LIS590DM) and the various GSLIS ontology courses. [You will in fact get a lot more out of an ontology courses if you have taken IML first, or take it concurrently].

Some courses to consider taking after this one:

- Information Processing (LIS452), the GSLIS introduction to programming concepts, data structures, and algorithms is a natural complement to Information Modeling and strongly recommended as a companion course at some point in your GSLIS career. The course contents of these two courses have been coordinated so that together they cover most of the fundamental topics of information systems that are important in information science. LIS452 can be taken before or after LIS561, or concurrently.
- As Information Modeling is not a course in hands-on systems analysis and database design, but is rather preparatory and foundational to that, students with no prior database development experience who anticipate immediate professional involvement in information systems should also take Introduction to Databases (LIS490DB) or Systems Analysis and Management (LIS453).

Programs: Information Modeling is one of the "core courses" in the GSLIS Digital Library CAS program.

Contraindications: Anyone with an undergraduate major in computer science or mathematics should contact the instructor before enrolling. Information Modeling is specifically designed for students with no relevant background, at all, in these areas. Often it can be also usefully taken by students with that background, but I want to have a chat with you first if you think fall into that category.

Assignments, Policies, Grading

Grading:

- Four marked exercises will be assigned and used as the principal basis of evaluation. See the schedule of marked exercises for information on topics and dates for the current semester. Each is open-book and open for 8-12 days. Some limited collaboration (but only on the web boards) will be allowed. More specific information about marked assignments will be posted later.
- General web board participation is expected and strongly encouraged. Web board participation of high quality will be calculated as extra credit. Particularly valued is giving clear and accurate assistance to fellow students having difficulties.

Grading rubric

Marked Exercises: 22/100 each (for a total of **88/100** for the four Marked Exercises)

Participation: 12/100 (including attendance and active participation on the forums)

Resources

Lecture Slides, class notes, other material: Slides will be posted shortly before class begins. Corrected slides for each class will be usually be available within a day or two.

Readings: Most readings are online.

Textbooks:

One free online and one to buy...

- A Modern Formal Logic Primer. (vols I and II). Paul Teller. Prentice Hall 1989. Available (free) online at: <http://tellerprimer.ucdavis.edu>. Abbreviated on the reading list as "Teller I" and "Teller II".
 - This is an excellent accessible treatment of first order logic, including two different inferencing systems and basic metatheory.
- Fundamentals of Database Systems, 6th Edition. Ramez Elmasri and Shamkant B. Navathe. Addison-Wesley, 2010.
 - This is the required text; it is the most widely assigned database textbook in computer science. It looks difficult, but the parts we do aren't hard at all. It is expensive, especially since we cover only the first third, but it is an excellent classic exposition of the material, and every LIS professional needs an authoritative database textbook within reach. Abbreviated on the reading list as "E&N".

How it works

Readings

Begin the assigned readings (in the order listed) *prior* to the class for which those readings are assigned, focusing on the broad outline and initial basic concepts. In the week following class study the remaining material (including topics not covered in class) and work assigned problems, using the web boards for discussion and mutual aid. There are more readings listed than can be studied carefully, so read them in order and according to the "Guidance Postings" (described below) and the suggestions in the syllabus ("study carefully", "browse", "optional", "just the main themes", "skip problem n", etc.).

Homework

Weekly unmarked homework assignments will be set, with answers provided. It is required that you do these exercises, and it is not possible to do well in the course without doing them, but they will not be graded. Unlimited collaboration is allowed, but preferably carried out, or reported, on the web boards.

"Live" sessions

In class I will introduce the material for the coming week, going into depth on some fundamental concepts and connections and providing a general orientation to the remainder. [Sometimes we'll also at the beginning of a class review aspects of the previous week's work and discuss the most persistent identified difficulties before beginning the new material.] Connections amongst the readings will be emphasized. Questions of clarification are strongly encouraged. Advanced questions, and digressions, will be acknowledged, but, again, discussion is deferred to the web boards.

Web boards

Web Board participation is at the heart of this course.

- Students will...
 - discuss the material
 - ask questions of clarification
 - offer answers to questions of clarification
 - post their answers to problem sets
 - ask for help with problem sets

 - explain how to do problems in problem sets
 - (Students who consistently provide clear effective help will receive extra credit for this).

- The instructors will...
 - present new material
 - clarify or correct misunderstandings as needed
 - address unresolved problems.

 - monitor all mutual aid, intervening with clarifications as needed
 - address unresolved problems
 - moderate all general discussions

Advanced topics and digressions will be taken up in forums defined for that purpose so as not to interfere with working through the basic assigned material.

Help with Difficulties

In general instructor assistance will take place only on the web boards, not privately. If you are having difficulties with something then other students are almost certainly having the same difficulty as well. And we can develop better clarifications if we develop them all together as a class, and on the boards. That's the LEEP way. And it works.

We are happy to talk with you individually (by phone, email, or when you visit) about your plans and interests, or your personal projects, or anything really — but all questions specifically about the course material, and especially all difficulties with the material, should be presented in forums.

"Guidance"

The instructor will frequently issue "Guidance" suggesting what to read carefully, what to browse, what to skip, what level of understanding or skill to go for, etc.

"Calls", pacing

Every 2-3 days the instructors will indicate where you should be in the readings and problems sets and frequently issue a "Call" to convene a discussion on the web forums on some problem set or topic or other that appropriate to the schedule. This is to keep us moving through the material at the same pace as much as possible, chunking

discussion of earlier material earlier in the week and later material later.

General expectations for progress

Students in this course will have a variety of backgrounds, abilities, interests, and time. While the course is optimized for students with no relevant background and no special aptitude, it is also designed to accommodate students with some relevant background already who want to learn more. So apart from the learning the basic material everyone advances from where they are, as much as they can and as much as they would like: some students will have their hands full with the basics, others will be pushing the limits of what is assigned. In a sense the content of the course will vary somewhat from student to student.

Number of classes

There are 15 scheduled class units.

The first class is not an introduction to the course (this syllabus does that); it is a full working class with reading assignments to be prepared prior to class.

Pros and cons

Some warnings...

1. This course has a fairly heavy workload, requiring 8-15 hours a week of preparation and web board participation, as well as class. Please plan your semester and class load accordingly
2. The nature of the material is such that most students who fall more than 6 days behind (during the first 8 weeks anyway) cannot catch up. Consequently the course has historically had a high drop rate.
3. Because of the amount of material being covered lectures present only a general introduction to each week's topics. Although further explanations of will be made on the web board, students will be responsible for learning much of the material on their own, studying the readings and problem sets and asking for assistance (through the web boards) as needed.
4. This is a course on the *foundations* of information modeling. It is not a course on information modelling. Specifically, it does not provide experience with software tools, or the details of particular modeling techniques. Rather it presents the underlying concepts and principles that are necessary for a deep understanding of information modeling and the efficient acquisition of superior modeling skills.

[With respect to information modeling the classroom is a good place to learn fundamental concepts, and a lousy place for learning practical skills; and the workplace is good place for learning practical skills and a lousy place for learning fundamental concepts. You'll be here at GSLIS for a year or two and then in the workplace for the rest of your life — plan accordingly.]

5. Finally, *this syllabus is not a contract*; rather it expresses our goals and plans. Every IML cohort is different and in any case it will be hard to keep up the brisk pace scheduled, so it is likely that I will need to make some changes in the schedules, assignments, due dates, etc. in order to respond to changing circumstances and keep the course as effective, fair, and manageable (for you) as possible. Of course I will give you fair warning, and fair accommodation when I do. [And, needless to say, an assignments have never moved forward in the semester, so no need to worry about surprises other than the pleasant variety]

And some good news...

1. *Difficulty*: This course is not even remotely as hard as it looks. I know that if you browse the syllabus and readings the material looks daunting. But we do not do anything that is exceptionally difficult, despite appearances.
2. *Grades*: Historically almost everyone (who stays in) does quite well as far as grades go. Probably this is in part because assignments may be repeated for an improved grade, and in part because students who don't like the course or who fall behind, drop out. I'll be frank: I want everyone to do really well, learn a lot, enjoy themselves (most of the time) -- and get a good grade; and I have tried hard to design the course to make all those things happen.
3. *Student evaluation*: Students enjoy the course; it has made the UIUC "Incomplete List of Courses Ranked Excellent" most years it has been offered. See the EON/ICES forms with student comments: 2005, 2006 -- those linked here are for Renear, but Wickett's are even better).
4. *Value*: You learn a lot of really important stuff that, mysteriously, many information professionals don't know (and don't know they don't know). This background will help you acquire superior modeling skills and play a leadership role in the profession.
5. *Ambience*: If you don't have fun you aren't doing it right.

This is the *syllabus*, a description of course content, objectives, policies, etc.
For the schedule of topics and assignments see the main Moodle page.
For the schedule of marked exercises see the *schedule of marked exercises*.



Last modified: Tuesday, September 3, 2013, 10:16 AM

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FA13LIS561LE

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Schedule of marked exercises

Schedule of Marked Exercises

There will be four "marked exercises". These are, in effect, take-home examinations.

Distribution: Each of the marked exercises will be distributed immediately following the last class of the unit, with the exercises for units 2 and 3 combined and distributed after the last class of unit 3.

Time allowance: Generally 10 days will be allowed.

Nature: All exercises consist of a combination of problems and short answer questions. There will be no surprises, and there will be no particularly difficult questions. Final determination of the content of the exercise will be influenced by the how much we cover, and absorb, in the unit.

Guidance: More information about exactly what kinds of problems will be on the exercise will be made available throughout the unit as it becomes clear how things are going with respect to coverage, difficulty, etc. Near the end of the unit I will give specific guidance as to what will be in the exercise.

Estimated Level of Effort: If you are thoroughly prepared then the exercises should take 4-6 hours, closer to 4 hours if you are thoroughly prepared and found the unit easy, closer to 6 if you are thoroughly prepared but found the unit very difficult. If you are not thoroughly prepared it may take much longer; if you are unprepared you will not be able to complete the assignment in the ten day period.

Collaboration: These exercises are open book. Private collaboration is forbidden; however I am very liberal about allowing posting questions (on the forums) asking for general help.

Submission: Exercises will be submitted through Moodle. Please submit in an editable document format (.doc, .docx, .rtf, or .txt).

Late Exercises: Please hand in your exercises on time. The accommodation of late exercises is entirely at my discretion: contact me as soon as you are aware that there will be a problem.

Schedule: *The dates below are approximate in order to accommodate the natural pace of the course. The actual date will be confirmed two weeks in advance.*

Schedule

Marked Exercise 1:

Unit 1: Sentence Logic and Basics

Posted: September 11

Due: September 21

Marked Exercise 2:

Unit 1: Predicate Logic and Metatheory

Posted: October 6

Due: October 18

Marked Exercise 3

Unit 2: Relation-based Modeling (RDMs)

Unit 3: Entity/Relationship-based Modeling (ER)

Posted: October 30

Due: November 9

Marked Exercise 4

Units 4: Grammar/Graph-based Modeling (XML)

Posted: November 20

Due: December 3

Last modified: Sunday, October 6, 2013 12:56 PM

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FA13LIS561LE



NEW COURSE OUTLINE

Departments/units should complete this form, obtain all necessary approvals and submit to their College Office to establish a new course. The outline will be reviewed by the College and forwarded to appropriate campus offices for additional approval.

All gray boxes on this form, except gray check boxes, are expandable text fields. Place your cursor in the box and start typing.

Instructions and guidance to complete certain numbered items in this form are contained in *Proposing New Courses* (<http://provost.illinois.edu/programs/cps/proposingcourses.html>) and *Procedures for Presenting New or Revised Graduate Courses* (<http://www.grad.illinois.edu/courses-procedures>).

Proposed Effective Term: Fall Spring Summer – 2015

Department/Unit Name: Graduate School of Library and Information Science

Department/Unit ORG Code: 1992

1. Course Subject and Number: LIS 542
2. Course Title (limit to 30 characters): Data, Stat, Info
3. Course description (Include subject matter, and any special course requirements such as field trips, special equipment, etc. Exclude other course information of any numbered items below; the Office of the Registrar will include it in the *Course Catalog* entry. It should read like a publication abstract and ideally be limited to about 75 words.):

An introduction to statistical and probabilistic models as they pertain to quantifying information, assessing information quality, and principled application of information to decision-making, with a focus on model selection and gauging model quality. The course reviews relevant results from probability theory, parametric and non-parametric predictive models, as well as extensions of these models for unsupervised learning. Applications of statistical and probabilistic models to tasks in information management (e.g. prediction, ranking, and data reduction) are emphasized.

4. Course prerequisites (prerequisite statements are not enforced through the Banner system):
Graduate standing.
5. Is there a restricted audience for this course? (Audience restrictions may only be placed in the Class Schedule. Do not include in prerequisite statement.)
 Yes No If yes, please specify the restrictions (e.g., “for majors only” or “junior standing required”): _____

COURSE JUSTIFICATION

6. **Please attach the course syllabus.** The syllabus should include basic and recommended texts (author, title, year of publication) as well as a list of the principal topics covered in this course, number of examinations, contact hours, work required of students, and basis for determining grade.

A. Undergraduate credit only

100- to 300-level: _____ * undergraduate hours

400-level: _____ * undergraduate hours (no graduate credit available)

B. Both Undergraduate and Graduate credit

400-level: _____ * undergraduate hours **and** 400-level: _____ * graduate hours

Note: Courses offered for both undergraduate and graduate credit require completion of Item 14.

C. Graduate credit only

500-level: 4 * graduate hours

Note: Courses offered for graduate credit require completion of Item 14.

D. Professional credit only

600- and 700-level: _____ * professional hours

E. Both Graduate and Professional credit

_____ * graduate hours **and** _____ * professional hours

Note: Courses offered for both graduate and professional credit require completion of Item 14.

* For A-E, if a course is offered for varying amounts of credit please select one of the two options:

Variable credit: this course is available for a range of credit hours (e.g., 1 to 3 hours)

Differential credit: this course is only available for two distinct credit-hour options (e.g., 1 or 3 hours)

In addition, complete Item 15.

14. For any course awarding graduate credit, please justify why it should, in terms of level of content, previous knowledge required, relevance to current research, methodology, etc. (See *Graduate College Policy for Proposed New and Revised Courses that Carry Graduate Credit* for criteria to judge graduate courses.): In addition to helping students gain mastery of a crucial subject, this course is intended to challenge students intellectually at a deep level. One goal of the course is to broaden students' appreciation for what constitutes a statistical model of an information-intensive process. At the same time, the course requires students to think deeply about assessing and comparing competing models. Thus, the course will highlight profound and subtle issues of information modeling at a level suitable for graduate students. Because the course was developed as part of the larger process of designing a new masters degree, it has been planned so that it fits closely with current offerings in GSLIS. With respect to the course's relation to state-of-the-art research, two points are relevant. First, the proposed case study (see attached syllabus) concerns an ongoing shared task from the information retrieval and machine learning communities. Thus, students will engage with material that is currently generating new research. Second, the proposed textbook (ISL, see attached syllabus), published in 2013, was selected in part because it offers numerous examples and extended homework problems that rely on data and methods used in relevant research.
15. For any course requesting variable or differential credit, please justify why the amount of credit varies and specify the work required for the additional credit: NA
16. May this course be repeated? (See *Procedures for Presenting New or Revised Graduate Courses* or Provost's *Proposing New Courses* for guidance in completing Parts A - C.)

Yes No If yes, please fill out A - C below:

A. Course Type

Indicate the **one** type of course the proposed course matches:

- Honors Subject mastery/skill proficiency Individualized instruction
 Research or ongoing study Special topics, seminars Applied experiences

B. Repeatable – same term

May students register in this course more than once (duplicate registration) in the same term?

- Yes No If yes, for how many total hours (fill all fields: NA = not applicable; U = unlimited)?
_____ undergraduate; _____ graduate; _____ professional
 check if “if topics vary” is an added qualifier

C. Repeatable – separate terms

May this course be repeated in separate terms?

- Yes No If yes, for how many total hours (fill all fields: NA = not applicable; U = unlimited)?
_____ undergraduate; _____ graduate; _____ professional
 check if “if topics vary” is an added qualifier

17. Are there credit restrictions?

- Yes No If yes, please specify the restrictions (e.g., for MATH 221: “Credit is not given for both MATH 221 and MATH 220.”): _____

18. Grading Type:

- Letter grade
 S/U (Any course offered for zero hours of graded credit must include S/U grade mode.)
 Both If Both is selected, which should be the default mode? Letter grade S/U
 DFR If DFR is selected, please justify the use of the grade: _____

CROSS-LISTING

19. Is this course to be cross-listed?

- Yes No If yes, please complete A and B and take notice of C:

A. Indicate the subject and course number of the cross-listing(s) (please note, all cross-listed courses must be offered at the same numerical level): _____

B. Please give the justification for establishing the cross-listing: _____

C. **Note: Additional approvals are required to establish a cross-listing.** An authorized official of each non-controlling department must endorse the cross-listing. In addition, if the cross-listing involves a different college, a dean of that college must also approve. (Letter, e-mail, or use of the Additional Approvals signature block at the end of this form are all acceptable methods of endorsement or approval.)

ADDITIONAL COURSE INFORMATION

20. Does this course replace an existing course?
 Yes No If yes, please list the course to be discontinued and note that submission of a Course Revision Form is necessary to remove it from the Course Catalog: _____
21. Does the addition of this course impact other courses (i.e., prerequisite or credit restriction statements)?
 Yes No If yes, please list the course(s) affected, and note that submission of Course Revision Form(s) are necessary to update the impacted course(s): _____
22. Does the addition of this course have any impact on your department's current curriculum (i.e., Programs of Study catalog, concentrations, minors, etc.)?
 Yes No If yes, please specify the curriculum and explain: The proposed course will be one of three courses required of students in the newly proposed Master of Science in Information Management degree (currently pending approval).
23. Has this course been offered as a special topics or other type of experimental course?
 Yes No If yes, please indicate the Banner subject, course number, section ID, term, and enrollment for each offering: _____
24. Will this course be submitted for General Education credit?
 Yes No
25. Does this course require students to register in multiple schedule components (e.g., lecture and a lab)?
 Yes No
26. Is a special facility needed to effectively teach this class (e.g., lab, studio, or ITS room)?
 Yes No If yes, please describe: _____
27. Will this course be offered on-line?
 Yes, online only Yes, online and traditionally No
28. Faculty member(s) who will teach this course: Miles Efron, Cathy Blake, Stephen Downie, Vetle Torvik, Victoria Stodden
29. Course proposed by: _____ Date: _____

NEW COURSE OUTLINE APPROVALS Course Subject and Number: LIS 542

(Signatures required)

 _____	<u>April 3, 2015</u> _____
Department/Unit	Date
 _____	<u>April 3, 2015</u> _____
School (if applicable)	Date
 _____	<u>April 3, 2015</u> _____
College	Date
_____	_____
Graduate College (Requests for Graduate Credit)	Date
_____	_____
Provost	Date

ADDITIONAL APPROVAL(S)

The space below may be used for additional approvals involving cross-listed courses. – see Section 19.C; – in lieu of letters or e-mails. Indicate department or college after signature and provide date.

Revised 8/2012

LIS542
Data, Statistical Models and Information
<semester> <year>
<location>, <meeting time>

Instructor: <TBD>
Instructor's office address: <TBD>
Office hours: <TBD>
Email: <TBD>

Instructional assistant: <TBD>
Assistant's office addresses and office hours: <TBD>
Assistant's telephone numbers and email addresses: <TBD>

Course Description:

An introduction to statistical and probabilistic models as they pertain to quantifying information, assessing information quality, and principled application of information to decision-making, with a focus on model selection and gauging model quality. The course reviews relevant results from probability theory, parametric and non-parametric predictive models, as well as extensions of these models for unsupervised learning. Applications of statistical and probabilistic models to tasks in information management (e.g. prediction, ranking, and data reduction) are emphasized.

Learning Objectives:

Students will demonstrate an understanding of probability theory and statistical learning by building and evaluating models of a diverse range of data sets. By the end of the course each student will be able to:

- Articulate the role of marginal, joint, and conditional probability in modeling processes involving information.
- Select, parameterize, and compare probability distributions as vehicles for modeling information.
- Specify, estimate and evaluate elementary parametric statistical models.
- Specify, estimate and evaluate elementary non-parametric statistical models.
- Balance the bias-variance tradeoff as it pertains to model selection.
- Articulate professional responsibilities with respect to creating, describing and using models built from data.

Pre- and Co-requisite: LIS452 Foundations of Information Processing in LIS is strongly recommended as a prerequisite. A highly motivated student could pass this course without LIS452 (so the prerequisite is not enforced), but programming will not be covered in this course. Students who have not completed an introductory course on statistics will need to come up to speed quickly on material covered early in the semester.

Required Texts

Johnson, R. A. (2009) *Statistics: Principles and Methods*. New York: Wiley. [available on reserve, abbreviated SPM]

James, G., Witten, D., Hastie, T., and Tibshirani, R. (2013) *An Introduction to Statistical Learning*. New York: Springer. [abbreviated ISL]

Manning, C. D., and Schütze, H. (1999) *Foundations of Statistical Natural Language Processing*. Cambridge, MIT Press. [available on reserve, abbreviated FSNLP]

Venables, W.N., Smith, D.M and the RCore Team (2012) *An Introduction to R*. [available online, <http://cran.r-project.org/doc/manuals/R-intro.pdf>, abbreviated ITR]

Course Schedule

Week	Topic	Reading
1	<ul style="list-style-type: none">Data, Models, and InformationReview of elementary statistics	NA
2	<ul style="list-style-type: none">Introduction to data analysis with RReview of tabular and graphical displays of data	ITR 1, 2, 5, 6, 7, 12
3	<ul style="list-style-type: none">Random variables, expectation and varianceJoint and conditional probabilityBayes rule	FSNLP 2.0-2.1.8
4	<ul style="list-style-type: none">Modeling data with common probability distributions	FSNLP 2.1.9-2.1.10
5	<ul style="list-style-type: none">Parameters and statistics	SPM 7.1-7.3, 8.1-8.5
6	<ul style="list-style-type: none">Introduction to linear models	ISL 1-2
7	<ul style="list-style-type: none">Linear regression: simple linear regression	ISL 3.0-3.1, 3.6.0-3.6.2

8	<ul style="list-style-type: none"> Linear regression: multiple linear regression 	ISL 3.2-3.5, 3.6.3-3.6.7
9	<ul style="list-style-type: none"> Classification by logistic regression 	ISL 4.0-4.3, 4.6.0-4.6.2
10	<ul style="list-style-type: none"> k-Nearest neighbor classification and regression 	ISL 2.2.3, 4.6.5
11	<ul style="list-style-type: none"> Model assessment by cross-validation 	ISL 5
<u>12</u>	<ul style="list-style-type: none"> Model selection The bias-variance tradeoff 	ISL 6.0-6.2, 6.4 – 6.5
<u>13</u>	<ul style="list-style-type: none"> Unsupervised linear models: Principal Component Analysis 	ISL 10.0-10.2
<u>14</u>	<ul style="list-style-type: none"> A case study: The TREC Knowledge Base Acceleration task 	NA
<u>15</u>	<ul style="list-style-type: none"> <u>A case study (contd): The TREC Knowledge Base Acceleration task</u> 	<u>NA</u>

Assignments and Methods of Assessment:

Assignment	%
1. Weekly homework	45
2. Midterm exam (take-home)	15
3. Final exam (take-home)	25
4. Class engagement	15

Class Participation Policy

Leaders are able to analyze complex situations with input from others. They can recognize and clearly articulate complex issues and problems to others. Leaders also know when and how to listen. To help students build these skills, this course requires sustained, ongoing participation. All students are expected to

attend class and contribute to course activities and discussions over the semester.

Attendance Policy

According to University policy: "For a graduate level course, attendance is expected, and should not be counted toward the final grade. The Student Code explicitly states that for all students, "(a) Regular class attendance is expected of all students at the University" (http://admin.illinois.edu/policy/code/article1_part5_1-501.html). Students missing more than one class session or who regularly arrive late or leave early will not pass the class unless alternate arrangements have been made with the instructor.

Academic Integrity

Please review and reflect on the academic integrity policy of the University of Illinois, http://admin.illinois.edu/policy/code/article1_part4_1-401.html to which we subscribe. By turning in materials for review, you certify that all work presented is your own and has been done by you independently.

If, in the course of your writing, you use the words or ideas of another writer, proper acknowledgement must be given. Not to do so is to commit plagiarism, a form of academic dishonesty. If you are not absolutely clear on what constitutes plagiarism and how to cite sources appropriately, now is the time to learn. Please ask!

Please be aware that the consequences for plagiarism or other forms of academic dishonesty will be severe. Students who violate university standards of academic integrity are subject to disciplinary action, such as a reduced grade, failure in the course, or suspension or dismissal from the University.

Statement of Inclusion

From the University's Diversity Values Statement

(<http://diversity.illinois.edu/SupportingDocs/Diversity%20Values%20Statement.pdf>):

As the state's premier public university, the University of Illinois at Urbana-Champaign's core mission is to serve the interests of the diverse people of the state of Illinois and beyond. The institution thus values inclusion and a pluralistic learning and research environment, one in which we respect the varied perspectives and lived experiences of a diverse community and global workforce. [The University supports] diversity of worldviews, histories, and cultural knowledge across a range of social groups including race, ethnicity, gender identity, sexual orientation, abilities, economic class, religion, and their intersections.

Furthermore, all students are expected to abide by the University of Illinois Student Code of conduct <http://studentcode.illinois.edu>.

Accessibility Statement

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-1970 (V/TTY), or e-mail a message to disability@illinois.edu.



NEW COURSE OUTLINE

Departments/units should complete this form, obtain all necessary approvals and submit to their College Office to establish a new course. The outline will be reviewed by the College and forwarded to appropriate campus offices for additional approval.

All gray boxes on this form, except gray check boxes, are expandable text fields. Place your cursor in the box and start typing.

Instructions and guidance to complete certain numbered items in this form are contained in *Proposing New Courses* (<http://provost.illinois.edu/programs/cps/proposingcourses.html>) and *Procedures for Presenting New or Revised Graduate Courses* (<http://www.grad.illinois.edu/courses-procedures>).

Proposed Effective Term: Fall Spring Summer – 2015

Department/Unit Name: Graduate School of Library and Information Science

Department/Unit ORG Code: 1992

1. Course Subject and Number: LIS 543
2. Course Title (limit to 30 characters): Sociotechnical Info Sys
3. Course description (Include subject matter, and any special course requirements such as field trips, special equipment, etc. Exclude other course information of any numbered items below; the Office of the Registrar will include it in the *Course Catalog* entry. It should read like a publication abstract and ideally be limited to about 75 words.):

The character, success, and costs/benefits of information technologies are socio-technical matters. Because of this, best practice for IT design and integration relies on participants' ability to understand and create for the totality of those settings, including social and technical dimensions. This course provides students with analytic tools for examining socio-technical settings and experience in applying that knowledge in IT modeling, design and management.

4. Course prerequisites (prerequisite statements are not enforced through the Banner system):
None
5. Is there a restricted audience for this course? (Audience restrictions may only be placed in the Class Schedule. Do not include in prerequisite statement.)
 Yes No If yes, please specify the restrictions (e.g., “for majors only” or “junior standing required”): _____

COURSE JUSTIFICATION

6. **Please attach the course syllabus.** The syllabus should include basic and recommended texts (author, title, year of publication) as well as a list of the principal topics covered in this course, number of examinations, contact hours, work required of students, and basis for determining grade.

400-level: _____ * undergraduate hours (no graduate credit available)

B. Both Undergraduate and Graduate credit

400-level: _____ * undergraduate hours **and** 400-level: _____ * graduate hours

Note: Courses offered for both undergraduate and graduate credit require completion of Item 14.

C. Graduate credit only

500-level: 4* graduate hours

Note: Courses offered for graduate credit require completion of Item 14.

D. Professional credit only

600- and 700-level: _____ * professional hours

E. Both Graduate and Professional credit

_____ * graduate hours **and** _____ * professional hours

Note: Courses offered for both graduate and professional credit require completion of Item 14.

* For A-E, if a course is offered for varying amounts of credit please select one of the two options:

- Variable credit: this course is available for a range of credit hours (e.g., 1 to 3 hours)
- Differential credit: this course is only available for two distinct credit-hour options (e.g., 1 or 3 hours)

In addition, complete Item 15.

14. For any course awarding graduate credit, please justify why it should, in terms of level of content, previous knowledge required, relevance to current research, methodology, etc. (See *Graduate College Policy for Proposed New and Revised Courses that Carry Graduate Credit* for criteria to judge graduate courses.): The vast majority of graduate students admitted to professional schools enter with a disciplinary background rooted in a single undergraduate major. This course will simultaneously build on existing knowledge that students may bring to the course in either social analysis or IT design while challenging them to acquire new skills, and integrate and apply all of their learning within the complex settings encountered by information professionals today. The course readings will draw heavily upon recent research and literature in sociotechnical analysis, information management and technology design.
15. For any course requesting variable or differential credit, please justify why the amount of credit varies and specify the work required for the additional credit: _____
16. May this course be repeated? (See *Procedures for Presenting New or Revised Graduate Courses* or Provost's *Proposing New Courses* for guidance in completing Parts A - C.)
- Yes No If yes, please fill out A - C below:

A. Course Type

Indicate the **one** type of course the proposed course matches:

- Honors Subject mastery/skill proficiency Individualized instruction
- Research or ongoing study Special topics, seminars Applied experiences

B. Repeatable – same term

May students register in this course more than once (duplicate registration) in the same term?

- Yes No If yes, for how many total hours (fill all fields: NA = not applicable; U = unlimited)?
_____ undergraduate; _____ graduate; _____ professional
 check if “if topics vary” is an added qualifier

C. Repeatable – separate terms

May this course be repeated in separate terms?

- Yes No If yes, for how many total hours (fill all fields: NA = not applicable; U = unlimited)?
_____ undergraduate; _____ graduate; _____ professional
 check if “if topics vary” is an added qualifier

17. Are there credit restrictions?

- Yes No If yes, please specify the restrictions (e.g., for MATH 221: “Credit is not given for both MATH 221 and MATH 220.”): _____

18. Grading Type:

- Letter grade
 S/U (Any course offered for zero hours of graded credit must include S/U grade mode.)
 Both If Both is selected, which should be the default mode? Letter grade S/U
 DFR If DFR is selected, please justify the use of the grade: _____

CROSS-LISTING

19. Is this course to be cross-listed?

- Yes No If yes, please complete A and B and take notice of C:

A. Indicate the subject and course number of the cross-listing(s) (please note, all cross-listed courses must be offered at the same numerical level): _____

B. Please give the justification for establishing the cross-listing: _____

C. **Note: Additional approvals are required to establish a cross-listing.** An authorized official of each non-controlling department must endorse the cross-listing. In addition, if the cross-listing involves a different college, a dean of that college must also approve. (Letter, e-mail, or use of the Additional Approvals signature block at the end of this form are all acceptable methods of endorsement or approval.)

ADDITIONAL COURSE INFORMATION

20. Does this course replace an existing course?

- Yes No If yes, please list the course to be discontinued and note that submission of a Course Revision Form is necessary to remove it from the Course Catalog: _____

21. Does the addition of this course impact other courses (i.e., prerequisite or credit restriction statements)?

- Yes No If yes, please list the course(s) affected, and note that submission of Course Revision Form(s) are necessary to update the impacted course(s): _____

22. Does the addition of this course have any impact on your department's current curriculum (i.e., Programs of Study catalog, concentrations, minors, etc.)?
 Yes No If yes, please specify the curriculum and explain: The proposed course will be one of three courses required of students in the newly proposed Master of Science in Information Management degree (currently pending approval).
23. Has this course been offered as a special topics or other type of experimental course?
 Yes No If yes, please indicate the Banner subject, course number, section ID, term, and enrollment for each offering: _____
24. Will this course be submitted for General Education credit?
 Yes No
25. Does this course require students to register in multiple schedule components (e.g., lecture and a lab)?
 Yes No
26. Is a special facility needed to effectively teach this class (e.g., lab, studio, or ITS room)?
 Yes No If yes, please describe: _____
27. Will this course be offered on-line?
 Yes, online only Yes, online and traditionally No
28. Faculty member(s) who will teach this course: Michael Twidale, Jon Gant, Les Gasser, Jerome McDonough, Masooda Bashir
29. Course proposed by: _____ Date: _____

NEW COURSE OUTLINE APPROVALS **Course Subject and Number: LIS 543**

(Signatures required)

Mr. J. Renee

April 3, 2015

Department/Unit

Date

Mr. J. Renee

April 3, 2015

School (if applicable)

Date

Mr. J. Renee

April 3, 2015

College

Date

Graduate College (Requests for Graduate Credit)

Date

Provost

Date

ADDITIONAL APPROVAL(S)

The space below may be used for additional approvals involving cross-listed courses. – see Section 19.C; – in lieu of letters or e-mails. Indicate department or college after signature and provide date.

Revised 8/2012

LIS543

Sociotechnical Information Systems

<semester> <year>
<location>, <meeting time>

Instructor: <TBD>

Instructor's office address: <TBD>

Office Hours: <TBD>

Email: <TBD>

Instructional Assistant: <TBD>

Assistant's office addresses and office hours: <TBD>

Assistant's telephone numbers and email addresses: <TBD>

Course Description:

The character, success, and costs/benefits of information technologies are socio-technical matters. Because of this, best practice for IT design and integration relies on participants' ability to understand and create for the totality of those settings, including social and technical dimensions. This course provides students with analytic tools for examining socio-technical settings and experience in applying that knowledge in IT modeling, design and management.

Learning Objectives:

Students completing this course will have achieved:

- Awareness of the goals of and history of thinking about analysis and design of information systems that are *responsive* to socio-technical dimensions of their settings of use.
- Knowledge of common 'recurrent dilemmas' of a socio-technical character in complex socio-technical information systems
- Understanding of complex decision-making situations and practices including decision-making under uncertainty, decision-making in both large and diverse institutions/organizations and in small groups, and recurrent decision-making over time.
- Awareness of and significant practice with at least four analysis, modeling, and design techniques/tools useful for socio-technical information

- systems, including conditions for employing/avoiding each technique, modeling costs etc.
- Awareness of the range of values and of ethical standpoints within which complex socio-technical design occurs, including concerns of diversity, differing knowledge domains, power.
 - Understanding of sources and approaches to power and value conflicts in IT settings.
 - Awareness of and significant experience with best practices for teamwork in highly diverse teams.

Prerequisites:

None.

Readings:

- Baxter, Gordon and Sommerville, Ian (Jan. 2011). Socio-technical systems: From design methods to systems engineering. *Interacting with Computers* 23(1): 4-17.
- Beyer, H., and Holtzenblatt, K., *Contextual Design: Defining Customer-Centered Systems*, Morgan Kaufmann Publishers, Inc., San Francisco, CA, 1998.
- Bijker, Wiebe E., and Law, John (Eds.)(1992). *Shaping Technology/Building Society: Studies in Sociotechnical Change*. Cambridge, MA: MIT Press.
- Brooks Jr, F. P. (1995). *The Mythical Man-Month, Anniversary Edition: Essays on Software Engineering*. Pearson Education.
- Checkland, P. (1999). Systems thinking. *Rethinking management information systems*, 45-56.
- Fei Hu, Ali Mostashari, Jiang Xie (Eds.)(2011). *Sociotechnical Networks: Science and Engineering Design*. Boca Raton: CRC Press.
- Friedman, B. (1996). "Value-sensitive design." *Interactions of the ACM*: 17-23.
- G. Kotonya and I. Sommerville (1998). *Requirements Engineering Processes and Techniques*.
- Gharajedaghi, J. (2011). *Systems thinking: Managing chaos and complexity: A platform for designing business architecture*. Elsevier.
- Hoffer, J. A., George, J. F., & Valacich, J. S. (2014). *Modern Systems Analysis and Design* (7th ed.). Boston: Pearson.
- Kelley, T., & Littman, J. (2006). *The Ten Faces of Innovation*. New York: Doubleday.
- Kendall, K., Kendal, J. (2008). *Systems Analysis and Design* (7th ed.). Boston: Pearson.

- Kling, R. (2000). "Learning about information technologies and social change: The contribution of social informatics." *The Information Society* 16: 217-232.
- Kurtz, C. F., & Snowden, D. J. (2003). The new dynamics of strategy: Sense-making in a complex and complicated world. *IBM systems journal*, 42(3), 462-483.
- Laplante, P.A. (2009) *Requirements Engineering for Software and Systems*. Auerbach.
- Markus, M. L., Majchrzak, A., & Gasser, L. (2002). A design theory for systems that support emergent knowledge processes. *MIS Quarterly*, 179-212.

Course Outline

(Schedule appears below)

1. Course Intro/Overview

2. History of ideas surrounding socio-technical analysis and design

3. Motivating cases and 'recurrent dilemmas' of socio-technical information systems

4. Socio-Technical Theory

Symbolic Interactionist, Functional, and Economic approaches to ICTs
 Infrastructures and Socio-technical Interaction Networks (STINs)
 Socio-Technical Systems Models (STS)
 Critical Theory & IT Analysis and Design
 Complex Decision-making models
 Values, Ethics and Diversity
 Designing for Diversity
 IP, Privacy & Security

5. Socio-Technical Analysis and Design Methods

Stakeholder Analysis Methods
 STS analysis
 Functional and Transaction Cost Analysis
 STIN modeling
 Systems Lifecycle Models
 Contextual Inquiry
 Workflow Analysis
 Participatory & Human-centered Design Practices
 Requirements Analysis; Requirements Specification

6. Modeling & Planning Tools

Basics of Organization and System Modeling / UML

Object-Role Modeling
 Workflow Modeling, Design & Execution

7. Implementation Components and Core Technologies

Web publishing frameworks
 Workflow modeling/execution tools
 Template Languages
 Design Patterns

8. Leadership and Management of STIS Projects

Project Management and Problem Solving Techniques
 Stakeholder Engagement
 Leading and managing system design teams
 Understanding the organization and organizational change
 Designer Blind Spots & How to Avoid Disaster
 How to assess the economic and social impact of systems from a STIS framework
 Managing implementation

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
Course Intro/Overview	█															
History	█	█														
Motivating Cases	█	█	█													
Socio-Technical Theory			█	█	█	█	█	█								
Complex Decision-making	<specific cases, principles, and dilemmas, part of "theory" and also woven throughout the course activities>															Final Exam
Values, Ethics and Diversity	<specific cases, principles, and dilemmas, part of "theory" and also woven throughout the course activities>															
Socio-Technical Analysis Methods							█	█	█	█						
Modeling and Planning Tools					█	█		█	█	█						
Implementation Components	█	█					█	█		█	█		█			

STIS Leadership & Management	<specific cases, principles, and dilemmas, part of "theory" and also woven throughout the course activities>											
Review/Recap												
Project Discussion/Presentation												
Exam												
Project (outside work)												
Readings (outside work)												
Homework (outside work)												

Project Discussion/Presentation:

Project(s)

The course projects provide practice applying and integrating the diverse components of the course, enabling students to engage with the course's theoretical issues in a practical way. They are intended to help students understand inevitable conflicts and trade-offs that occur in complex settings, and how to make decisions and implement solutions to deal with them. For example, students will encounter pressure to satisfy specific, powerful constituencies in particular ways, or to add ever more functionality - each demand backed up with rational individual reasons - which together can make a system unusable, unwieldy or unaffordable.

Assignments and Methods of Assessment:

Assignment	%
1. Homework	25
2. Midterm exam (take-home)	20
3. Projects	20
4. Class engagement	10
5. Final exam	25

Class Participation Policy

Leaders are able to analyze complex situations with input from others. They can recognize and clearly articulate complex issues and problems to others. Leaders also know when and how to listen. To help students build these skills, this course requires sustained, ongoing participation. All students are expected to attend class and contribute to course activities and discussions over the semester.

Attendance Policy

According to University policy: "For a graduate level course, attendance is expected, and should not be counted toward the final grade. The Student Code explicitly states that for all students, "(a) Regular class attendance is expected of all students at the University" (http://admin.illinois.edu/policy/code/article1_part5_1-501.html). Students missing more than one class session or who regularly arrive late or leave early will not pass the class unless alternate arrangements have been made with the instructor.

Academic Integrity

Please review and reflect on the academic integrity policy of the University of Illinois, http://admin.illinois.edu/policy/code/article1_part4_1-401.html to which we subscribe. By turning in materials for review, you certify that all work presented is your own and has been done by you independently.

If, in the course of your writing, you use the words or ideas of another writer, proper acknowledgement must be given. Not to do so is to commit plagiarism, a form of academic dishonesty. If you are not absolutely clear on what constitutes plagiarism and how to cite sources appropriately, now is the time to learn. Please ask me!

Please be aware that the consequences for plagiarism or other forms of academic dishonesty will be severe. Students who violate university standards of academic integrity are subject to disciplinary action, such as a reduced grade, failure in the course, or suspension or dismissal from the University.

Statement of Inclusion

From the University's Diversity Values Statement

(<http://www.inclusiveillinois.illinois.edu/chancellordivstmntswf.html#ValueStmnt>):

As the state's premier public university, the University of Illinois at Urbana-Champaign's core mission is to serve the interests of the diverse people of the state of Illinois and beyond. The institution thus values inclusion and a pluralistic learning and research environment, one which we respect the varied perspectives and lived experiences of a diverse community and global workforce. [The University supports] diversity of worldviews, histories, and cultural knowledge across a range of social groups including race, ethnicity, gender identity, sexual orientation, abilities, economic class, religion, and their intersections.

Furthermore, all students are expected to abide by the University of Illinois Student Code of conduct <http://studentcode.illinois.edu>.

Accessibility Statement

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-1970, or e-mail a message to disability@uiuc.edu.



**REQUEST & JUSTIFICATION FORM FOR PROGRAM CLASSIFICATION
TRADITIONAL, SELF-SUPPORTING or REIMBURSABLE**

CURRENT PROGRAMS:

Current graduate programs can request a change in classification to Traditional or Reimbursable, but not to Self-supporting.

NEW PROGRAMS:

New programs seeking Traditional classification do not need to complete this form.

New programs seeking Self-supporting classification should be aware of the following:

- a) Students enrolled in Self-supporting programs are ineligible to hold waiver-generating appointments. NOTE: There is no mechanism within the Human Resources Front End system that restricts the appointment of a Self-supporting program student to an assistantship. Therefore, if a unit (faculty or staff) appoints a student, in error, significant problems result for everyone involved.
- b) Self-supporting status results in reduced flexibility for the program. Even if a student in the program is most qualified for a particular assistantship appointment and financing is available through the program, the program status makes the student ineligible.
- c) Because Traditional, Reimbursable and Self-supporting programs each yield 90% of net tuition, and the Reimbursable classification avoids the limitations above, a program might find the Reimbursable classification more advantageous than Self-supporting.

Please contact the Fellowship Office at the Graduate College if you have questions or seek clarifications, (217) 333-0036 or gradfellowships@illinois.edu.

COLLEGE OR SCHOOL: Graduate School of Library and Information Science

IS THIS A NEW OR EXISTING PROGRAM:

New Program
 Existing Program Program Code: _____ Current Classification: _____

REQUESTED CLASSIFICATION: TRADITIONAL REIMBURSABLE SELF-SUPPORTING

JUSTIFICATION: On a separate sheet, please address the following.

1. Describe the reasons for this request and explain: (a) the pros and cons of the classification requested, and (b) how the requested classification will benefit and not adversely affect the academic quality of the program.
2. Describe the expected impact of the requested classification to new students. How will these measures affect the affordability of the program? What type of financial aid, if any, will be offered? Note: Continuing students will not be affected as they are subject to the rules in effect at the time of their admission.
3. What provisions will be made to communicate the implications of the classification to prospective and newly admitted students?
4. Name the college and program contact persons in charge of implementing and communicating the classification and its consequences to students.

Unit Head Signature and Date  Allen H Renear; Feb 14, 2015

College Dean Signature and Date  Allen H Renear; Feb 14, 2015

REQUEST & JUSTIFICATION FORM FOR PROGRAM CLASSIFICATION TRADITIONAL, SELF-SUPPORTING or REIMBURSABLE

1) Describe the reasons for this request and explain: (a) the pros and cons of the classification requested, and (b) how the requested classification will benefit and not adversely affect the academic quality of the program.

We cannot afford to offer this program under the traditional classification. Our single revenue generating degree, the M.S. in Library and Information Science, requires substantial General Revenue Fund support and our unit is currently financially challenged. Moreover this program will attract students with skills that are in demand at the University (programming, database management, etc.) and so a high proportion of on-campus students would receive assistantships if the program operated under the traditional classification.

The self-supporting classification would not be a disadvantage with respect to academic quality. With the self-supporting classification we will be better positioned to hire leading faculty, provide teaching assistantships (to those in our doctoral program), and maintain an effective infrastructure of advising, career services, administration, and information technology.

2. Describe the expected impact of the requested classification to new students. How will these measures affect the affordability of the program? What type of financial aid, if any, will be offered? Note: Continuing students will not be affected as they are subject to the rules in effect at the time of their admission.

This program can be completed in 12 months and so the impact on students, both in terms of tuition and time away from employment, will be relatively modest. In addition this program is preparing students for occupations where employment outlook is quite good and starting salaries fairly high, so if borrowing is necessary the repayment burden will be somewhat easier than it would be in other programs, such as our M.S. in Library and Information Science.

We are fully committed to helping students with financial need as well as to maintaining a diverse and inclusive student body. We intend to develop a scholarship program specifically to provide tuition support for students with need and to support diversity and inclusion. We will fund this by reallocating 5% of our annual retained tuition revenue from the degree program to a scholarship fund. In addition many of our existing scholarship funds will be immediately available to students in this program.

3. What provisions will be made to communicate the implications of the classification to prospective and newly admitted students?

Following existing practices at the University (e.g. <http://www.hcom.illinois.edu/apply/aid/>), we will clearly communicate the implications of the self-supporting classification in all appropriate descriptions of our program and reiterate these implications in application materials. Our Student Affairs staff and our Communications staff will give this communication the highest priority.

4. Name the college and program contact persons in charge of implementing and communicating the classification and its consequences to students.

Linda C Smith, Associate Dean for Academic Programs
Kathleen McDowell, Assistant Dean for Student Affairs

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Graduate School of Library and Information Science

Library and Information Science Building
501 East Daniel Street
Champaign, IL 61820-6211



The Graduate College
University of Illinois at Urbana-Champaign
204 Coble Hall, MC-322
Champaign, Illinois 61820

Financial Arrangements for the Proposed Degree: MS in Information Management

GSLIS already has the faculty, courses, and staff infrastructure needed to offer this degree -- no external funding is required to initiate the program and resources for continued growth will be provided by tuition revenue from the new program.

The proposed program is not a new area of study for GSLIS, but is rather a refactoring of our current instructional offerings in order to (i) provide better educational preparation for students who wish to enter technology-intensive information professions, and (ii) enable GSLIS to better compete with iSchools who are addressing the broad field of information science education with two (or more) MS degrees rather than with just one (as we have been doing).

Start-up: GSLIS already has the staff and faculty capacity to begin this program and grow enrollment to at least 100 students. There will therefore be no significant new expenses during this period and we seek no new resources, nor do we need to carry out any significant reallocation of existing resources. Over the last five years total enrollment in the GSLIS M.S. in Library and Information Science program has fallen by about 130 students (21%), while the number of teaching faculty has increased; these changes represent our capacity to absorb additional students -- as well as our need to begin this new program.

Expansion: Growing enrollment beyond 100 may require some additional staffing, but this will be easily supported by the additional tuition revenue realized from the program, particularly as our proposed self-supporting classification will ensure improvement in the quantity and management of tuition revenue. In addition, as this is a professional program we expect to continue to make appropriate use of adjunct instructors, as we do in our MS in Library and Information Science program. [Our adjunct instructors are typically leading practitioners employed in information management roles at universities, industry, and public sector or non-profit organizations.]

Maturity: We anticipate an enrollment of 200-350 students within a few years, with most of these students enrolled in the distance option. At this level of enrollment some additional tenure-system faculty and staff will be needed. However all additional costs will be easily met by existing and new tuition revenue given (i) the capacity in the current tenure-system faculty, (ii) additional tuition from the MSIM, and (iii) the financial advantages of a self-supporting classification.

A handwritten signature in cursive script, appearing to read 'Allen H. Renear'.

Allen H. Renear
Dean, Graduate School of Library and Information Science
University of Illinois at Urbana-Champaign

UNIVERSITY OF ILLINOIS
AT URBANA - CHAMPAIGN

Department of Computer Science

201 North Goodwin Avenue
Urbana, IL 61801-2302 USA



14 February 2015

The Graduate College
University of Illinois at Urbana-Champaign
204 Coble Hall, MC-322
801 S Wright Street
Champaign, IL 61820-6242

To Whom It May Concern:

I am writing in support of the proposed new MS degree, to be offered by the Graduate School of Library and Information Science (GSLIS), entitled “Master of Science in Information Management”. My colleague, Dean Allen Renear, has kept me apprised of the goals and design of this proposed program for some time, and I’m extremely pleased to see these efforts come to fruition. The Department of Computer Science believes strongly that this is an excellent (and long needed) addition to the overall portfolio of information-themed professional masters-level degrees at Illinois. The degree is, in particular, an excellent complement to degrees already on offer in Computer Science. The new MS in IS fills an important gap, by focusing strongly on a human-centered approach to information services and systems – which plays perfectly into GSLIS’s historical strengths.

As the country’s leading information science school, I think it imperative that GSLIS has on offer a strong, IS-themed professional degree program. In the CS domain, we see incredible, growing demand for *all* Information Technology educational offerings. Indeed, the US Bureau of Labor Statistics (BLS) routinely publishes data about the remarkable gap between jobs-on-offer in this very large space, and capable graduates. The unique focus of the proposed degree specializations on curation, social-technical analytics, and community informatics, offers an attractive differentiator that, I believe, will be extremely compelling for students. I believe the degree will flourish financially, and will provide a critical, new contribution to the university’s evolving “Data” agenda.

I look forward to collaborating with my colleagues in GSLIS, as they work to advance the university’s coverage of information and data science.

Sincerely,



Rob A. Rutenbar
Abel Bliss Professor and Head
Department of Computer Science
University of Illinois at Urbana-Champaign

UNIVERSITY OF ILLINOIS
AT URBANA - CHAMPAIGN

College of Engineering

Office of the Dean
306 Engineering Hall, MC-266
1308 West Green Street
Urbana, IL 61801
217-333-2150



February 16, 2015

RE: Endorsement of the Proposed GSLIS Master of Science in Information Management

To Whom It May Concern:

With this letter, the College of Engineering would like to endorse the proposal from the Graduate School of Library and Information Science for a new Master of Science in Information Management.

The proposed new degree leverages the intellectual foundation, faculty expertise, and national and global stature of GSLIS in a manner that sets it apart from other similar degrees and programs of study. In particular, it is designed to provide interested students the opportunity to develop an exceptional foundation in contemporary information systems and services, while developing special skills in the application of data science and statistical modeling to a broad spectrum of interdisciplinary, human-centered applications.

Currently, several options for professional masters programs on data science are under consideration in the College of Engineering. However, the proposed GSLIS MS conflicts with none of them.

We believe that the proposed degree will contribute in a unique way in the diverse spectrum of educational opportunities offered by our campus in the broad and fast-growing space of data and information science. We expect it to quickly grow into a successful program.

Sincerely,

A handwritten signature in black ink, appearing to read 'AC Cangellaris'.

Andreas C. Cangellaris
Dean, College of Engineering
M. E. Van Valkenburg Professor
in Electrical and Computer Engineering

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Department of Business Administration
College of Business
350 Wohlers Hall
1206 South Sixth Street
Champaign, IL 61820-6980



February 18, 2015

Dear Graduate College,

The Department of Business Administration supports the Graduate School of Library and Information Science's (GSLIS) proposal to establish a new Masters of Science in Information Management (MSIM) program.

Over the past few months, our department has worked closely with GSLIS to clearly distinguish their proposed program from our currently established programs in related domains, most notably, our Masters of Science in Technology Management (MSTM) program. Our MSTM program has a strong technology focus and enables students to obtain a concentration in information technology. Thus, on the surface, there may appear to be some similarity between our MSTM program and GSLIS' proposed MSIM program. We carefully discussed this concern with GSLIS and have been assured that the potential overlap in terms of students, curriculum, and placement will be minimal. Our understanding is that the proposed MSIM program will be largely focused on how information is managed in educational, cultural, and scientific institutions, government agencies, and community organizations. In contrast, our MSTM program focuses on the management of information in business settings. In order to ensure that this distinction is maintained, our two units have agreed to cooperate in terms of recruiting applicants and advertising our respective programs on each other's websites. We believe that this distinction is important to the success of both programs.

I believe that the MSIM program will be a nice addition to our university's portfolio of program offerings in the information space and that its public-sector focus provides a nice complement to our MSTM's private-sector focus. If I can be of further assistance, please let me know (aric@illinois.edu).

Sincerely,

A handwritten signature in black ink that reads 'Aric Rindfleisch'.

Aric Rindfleisch
Head, Department of Business Administration

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

College of Business
Office of the Dean
260 Wohlers Hall
1206 South Sixth Street
Champaign, IL 61820-6980



The Graduate College
University of Illinois at Urbana-Champaign
204 Coble Hall, MC-322
801 S Wright Street
Champaign, IL 61820-6242

To Whom It May Concern:

This letter represents my support of the proposed new MS degree, to be offered by the Graduate School of Library and Information Science (GSLIS), entitled “Master of Science in Information Management.” I have discussed this new program with Dean Allen Renear. I believe this proposed program will be an important addition to the professional masters programs on our campus, especially in the area of information. The summary of the proposed degree states the it “emphasizes an interdisciplinary human-centered approach to information services and systems that is grounded in the discipline of information science.” GSLIS has demonstrated its leadership as the number one ranked information science school. As such, it is in a perfect position to create another world class professional program, one that will only increase the visibility of our campus in the area of information services and systems.

In today’s environment, every college on campus is well aware of the need to integrate data analytics into its curriculum and education. Our campus simply must redouble its efforts in this important cross-discipline arena. The proposed program’s list of specializations, including Community Informatics, Data Curation, and Socio-Technical Data Analytics, is on-target given the existing strengths of GSLIS, the students the program will attract, and the demand from the market for professionals with these types of skills. And, they fill a great need as many units across our campus turn their attention to information sciences and services.

I believe this program will be a great success, both academically and financially. I also believe the program will prove to be a great opportunity for collaboration for many different units, including the College of Business.

Sincerely,

A handwritten signature in blue ink, appearing to read 'L DeBrock'.

Larry DeBrock
Josef and Margot Lakonishok Endowed Dean
College of Business

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

University Library
Office of Dean of Libraries
and University Librarian
230 Main Library, MC-522
1408 West Gregory Drive
Urbana, IL 61801



January 15, 2014

Allen Renear
Dean and Professor
Graduate School of Library and Information Science
501 East Daniel Street
M/C 493
Champaign, Illinois 61820-6211

Dear Dean Renear:

Thank you for providing the University Library with the opportunity to review the Graduate School of Library and Information Science's proposal to the Senate's Committee on Educational Policy to establish a new Master of Science in Information Management. Based upon the proposal that we reviewed, we conclude that there will be no substantive impact on existing library resources: we have both the library materials and personnel to support this program. Resources that we are already acquiring with funds that support studies in GSLIS, the Engineering, and, in some cases, Business provide a firm foundation upon which to support curricular needs.

On a personal and professional note, I want to add that I am excited by the prospect of the addition of this program to GSLIS. The University Library and GSLIS have a long history of working closely together. I have every confidence that we will be able to work together to meet the needs of the students in this program. The profession and our own Library will benefit from the addition of the program, and the opportunities for GSLIS with the University Library as "lab" are powerful.

Sincerely,

A handwritten signature in black ink, appearing to read 'John P. Wilkin', with a long, sweeping flourish extending to the right.

John P. Wilkin
Juanita J. and Robert E. Simpson
Dean of Libraries and University Librarian

c: Thomas Teper
Dan Tracy