Data, information and technology are central in modern libraries and information services. This cluster encompasses the essential foundational knowledge that prepares emerging professionals for careers in the continuously evolving information environment. All pathways in this area build from foundational studies in digital technologies, organized to focus on data, the Internet, and information systems. Students may elect to specialize in one of five areas, or with an advisor’s guidance, plan a specialized path. Students interested in the creation, storage, and accessibility of digital information resources focus on digital libraries. The long-term accessibility of digital resources is a key concern, addressed by professionals specializing in digital preservation. With the advent and evolution of globally massive data repositories, the challenges of data management are addressed by specialists in the practices of data production and data usage. Data repositories are generated by a variety of sources - scientific research, government, business, and modern information systems such as social networks, the Internet of Things, and citizen science. These swelling resources offer rich potential for the development of new knowledge when combined with the skills of professional data analytics. Across data, information, and technology practices, specialists in evaluation bring rigorous analysis methods to questions about how well information systems are meeting the needs of service providers and user communities.
Data Analytics
In recent years, we have heard many buzzwords such as big data and data science in academia. The common denominator of all of them is the great need for data analytics skills. The pervasive nature of big data and cloud technologies is not limited to computer science or informatics; it touches upon many disciplines. The McKinsey Global Institute has predicted that by 2018 the U.S. could face a shortage of between 140,000 to 190,000 people with deep analytical skills, and a shortage of 1.5 million managers and analysts who know how to leverage data analysis to make effective decisions. The demand for such skills has been on a steady rise and most predictions about the job market suggest such skills are expected to be the most valuable and well-paid in the future. Specialization in this area requires understanding of data collection, extraction, processing, and analysis. Therefore, courses covering data wrangling, inferential statistics, data mining, machine learning, and data management are necessary for this track.

For further information on this area, please consult the advising sheet for the Data Analytics pathway.

Digital Libraries
Digital Libraries are a central service area in libraries, archives, museums, and other cultural, civic, and business institutions. Jobs in this area are found in traditional collection-focused roles, and in newer user-centered roles. Specialization in this area requires understanding the fundamentals of digital technology and the essential functional components that comprise DLs: collection policy, digitization, description using metadata, digital library management systems, and Web-based exposure, integration, and retrieval of digital resources. In addition, all of these components must be understood in the context of digital library users and their needs.

For further information on this area, please consult the advising sheet for the Digital Libraries pathway.

Digital Preservation
According to the Association of Library Collections and Technical Services, “Digital preservation combines policies, strategies and actions to ensure access to reformatted and born digital content regardless of the challenges of media failure and technological change. The goal of digital preservation is the accurate rendering of authenticated content over time.” Students wishing to focus in the digital preservation area will pursue specialized coursework in information technology, digital preservation and curation, archival studies, and metadata schemas and application profiles for preservation.

For further information on this area, please consult the advising sheet for the Digital Preservation pathway.

Research Data Management
Research data management is a growing area. Data management of large data sets and longitudinal research data involves a diverse range of skills, including working and communicating directly with scientists, project managers, field staff, library staff, and dataset users. Data management positions can require: managing daily workflows of information, supervising the checking and validity of the data, managing data dictionaries and taxonomies,
responsibility for training and defining vocabularies and systems, managing data requests from a range of stakeholders and third parties, and maintaining intellectual control over a range of data types and datasets over time.

For further information on this area, please consult the advising sheet for the Research Data Management pathway.

**User-Centered Evaluation**
Modern libraries, museums and archives use a broad range of information systems that produce valuable data for understanding how, when, and where specific services and resources are used. In an era of scarce funding, it is essential that LAMs gather and understand evidence for the value of existing services and for patron needs that are unmet or under provisioned. “Evidence-based” professional practice requires training in methods of gathering, analyzing and reporting on user needs, current practices, and predicted outcomes to propose and manage changing to services. Crossing disciplinary areas, study in user-centered evaluation provides students with a solid foundation for entering this emerging and essential area of the information professions.

For further information on this area, please consult the advising sheet for the User-Centered Evaluation pathway.

**Faculty Supporting the Data / Information / Technology Area and Associated Pathways:**

**Full-Time Faculty**
- Karen F. Gracy, Ph.D.
- Catherine L. Smith, Ph.D.
- Heather Soyka, Ph.D.
- Marcia L. Zeng, Ph.D.
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**Adjunct Faculty**
- Sean Petiya, M.S., M.L.I.S.