Applied Data Science (ADS) Pathway — Required and Recommended Courses

Data Science is highly interdisciplinary and Kent State University offers various programs to address the workforce demand in an increasingly data-driven society. While there are some common basic data knowledge and skills across various programs, each program has a particular disciplinary identity in the very broad DS research and education landscape. The Applied Data Science (ADS) pathway in the School of Information (iSchool) emphasizes users, tools, and applications in a holistic approach to Data Science that concerns the full data lifecycle and is human-centered, socially responsible, and context-driven. The ADS pathway prepares students for a career in Data Science with practical skills to solve real-world data problems at application levels, rather than computational or system development levels. It offers training in information and knowledge organization principles, data management, and hands-on skills to solve data problems in application domains.

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<thead>
<tr>
<th>REQUIRED MLIS CORE (13 CREDIT HOURS)</th>
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<tbody>
<tr>
<td>LIS 60020 Information Organization</td>
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<td>LIS 60030 People in the Information Ecology</td>
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<td>LIS 60040 Information Institutions and Professions</td>
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<td>LIS 60050 Research and Assessment in Library and Information Science</td>
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<td>LIS 60280 Master’s Portfolio in Library and Information Science</td>
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<th>FOUNDATIONAL (KEY) COURSES (15 CREDIT HOURS)</th>
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<tr>
<td>LIS 50645 Database Fundamentals for Information Professionals</td>
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<td>LIS 50646 Research Data Management (Prerequisite: LIS 60510)</td>
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<tr>
<td>LIS 60510 Digital Technologies I: Data Fundamentals</td>
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<td>LIS 60511 Digital Technologies II: Internet Fundamentals (Prerequisite: LIS 60510)</td>
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<td>LIS 60512 Digital Technologies III: Systems Fundamentals (Prerequisite: LIS 60511)</td>
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<td>LIS 60636 Knowledge Organization Structures, Systems and Services (Prerequisite: LIS 60020)</td>
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<td>LIS 61095 Special Topics: Fundamentals of Applied Data Science</td>
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<td>LIS 50647</td>
<td>Introduction to Digital Humanities</td>
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<td>LIS 60613</td>
<td>Information Needs, Seeking and Use (Prerequisite: LIS 60030)</td>
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<td>LIS 60631</td>
<td>Introduction to Digital Preservation (Prerequisite: LIS 60020 and LIS 60511)</td>
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<td>LIS 60633</td>
<td>Digital Curation (Prerequisite: LIS 60511)</td>
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<td>LIS 60637</td>
<td>Metadata Architecture and Implementation (Prerequisite: LIS 60020)</td>
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<tr>
<td>LIS 60692</td>
<td>Internship in Information and Cultural Heritage Institutions (Prerequisite: LIS 60040)</td>
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<td>LIS 61096</td>
<td>Individual Investigation</td>
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<td>HI 60411</td>
<td>Clinical Analytics 1</td>
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<td>UX 60001</td>
<td>User Experience Design Principles and Concepts</td>
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Applied Data Science (ADS) Pathway — Additional Information and Resources

**Competencies (knowledge, skills) for this pathway:**

- Leadership in the field of processes and systems to extract knowledge or insights from data, either structured or unstructured, using statistics, machine learning, data mining, semantic analysis, and predictive analytics
- Supervise/perform the creation of analytics and scientific exploration
- Develop the documentation and process to identify metrics, targets, weights and resulting performance reports for network providers
- Utilize data to translate findings into actionable information for providers and leaders
- Oversee the architecture of integration approach for disparate data systems including use of enterprise data warehouse, external vendor supplied information and any future systems
- Serve as a subject matter expert on data modeling, system architecture, data governance and business intelligence tools
- Apply multiple, federated, linked data models
- Provide data lineage, support for temporal models and streaming data
- Leadership in reimagining the intersection of data and information supporting services
- Create technical interfacing between analytics/dashboard directly to provider portal/ websites or mobile devices for up-to-date reporting for providers
- Support of care coordination by supplying information related to registry, user information and other operational requirements to internal or external services
- Possess a strong academic curiosity, and ability to conduct scientific research that can solve unique problems
- Provide comprehensive data services in support of the University’s teaching, learning, and research needs
- Design of efficient data ingestion through ETL and messaging systems
- Develop data governance and data quality standards & tooling

**Sample job titles:**

- Data Analyst
- Data and Information Visualization Librarian
- Data Curation Librarian
- Data Librarian
- Data Management Specialist
- Data Science Librarian
- Data Scientist
- Data Services Librarian
- Data Services Specialist
- Data Strategist
- Data Visualization/Data Analyst
- Digital Scholarship Librarian
- Digital Solutions Data Scientist
- Manager, Data Science and Analytics
- Research Data Librarian
- Research Data Manager
- Digital Testing, Analytics & Optimization Manager
Professional organizations:

- Association of Computing Machinery (ACM):
  - Special Interest Group: Knowledge Discovery and Data Mining (SIG KDD), https://www.kdd.org
  - Special Interest Group (SIG): Artificial Intelligence (SIG AI), https://sigai.acm.org
  - Special Interest Group on Management of Data (SIG MOD), https://sigmod.org
- Research Data Access & Preservation (RDAP), https://rdapassociation.org
- Research Data Alliance (RDA), https://rd-alliance.org
- Association of Data Scientists (ADaSci), https://www.adasci.org
- Data Science Association (DSA), https://www.datascienceassn.org
- Data Governance Professionals, https://dgpo.org

Professional/disciplinary journals with related articles:

- Big Data & Society
- Information Processing and Management
- International Journal of Digital Curation
- Journal of eScience Librarianship
- Journal of Information Science
- Journal of the Association for Information Science and Technology (JASIST)
- Journal of Applied Data Sciences

Additional professional resources:

- RDMLA - https://rdmla.github.io/
The Research Data Management Librarian Academy (RDMLA) is a free online professional development program for librarians, information professionals, and other professionals who work in a research-intensive environment throughout the world.
- ALA data literacy related resources - https://literacy.ala.org/data-literacy/
- International Science Council Committee on Data (CODATA) - https://codata.org/

References Cited: