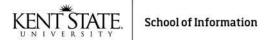# Applied Data Science (ADS) Pathway — Required and Recommended Courses

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.[1] 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.[1][2][3] 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.

REQUIRED MLIS CORE (13 CREDIT HOURS)		
LIS 60020	Information Organization	3
LIS 60030	People in the Information Ecology	3
LIS 60040	Information Institutions and Professions	3
LIS 60050	Research and Assessment in Library and Information Science	3
LIS 60280	Master's Portfolio in Library and Information Science	1

FOUNDATIONAL (KEY) COURSES (15 CREDIT HOURS)		
LIS 50645	Database Fundamentals for Information Professionals	3
LIS 50646	Research Data Management (Prerequisite: LIS 60510)	3
LIS 60510	Digital Technologies I: Data Fundamentals	1
LIS 60511	Digital Technologies II: Internet Fundamentals (Prerequisite: LIS 60510)	1
LIS 60512	Digital Technologies III: Systems Fundamentals (Prerequisite: LIS 60511)	1
LIS 60636	Knowledge Organization Structures, Systems and Services (Prerequisite: LIS 60020)	3
LIS 61095	Special Topics: Fundamentals of Applied Data Science	3

RECOMMENDED ELECTIVES (CHOOSE 9 CREDIT HOURS)		
LIS 50647	Introduction to Digital Humanities	3
LIS 60613	Information Needs, Seeking and Use (Prerequisite: LIS 60030)	3
LIS 60631	Introduction to Digital Preservation (Prerequisite: LIS 60020 and LIS 60511)	3
LIS 60633	Digital Curation (Prerequisite: LIS 60511)	3
LIS 60637	Metadata Architecture and Implementation (Prerequisite: LIS 60020)	3
LIS 60692	Internship in Information and Cultural Heritage Institutions (Prerequisite: LIS 60040)	2-3
LIS 61096	Individual Investigation	1-3
HI 60411	Clinical Analytics 1	3
UX 60001	User Experience Design Principles and Concepts	3

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:

- American Society of Information Science & Technology (ASIST), https://www.asist.org
- 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:

[1] Zhang, Y., Wu, D., Hagen, L., Song, I. Y., Mostafa, J., Oh, S., ... & Saltz, J. S. (2022). Data science curriculum in the iField. *Journal of the Association for Information Science and Technology*. https://doi.org/10.1002/asi.24701

[2] Shah, C., Anderson, T., Hagen, L., & Zhang, Y. (2021). An iSchool approach to data science: Human-centered, socially responsible, and context-driven. *Journal of the Association for Information Science and Technology*, *72*(6), 793-796. https://doi.org/10.1002/asi.24444

[3] Song, I. Y., & Zhu, Y. (2017). Big data and data science: Opportunities and challenges of iSchools. *Journal of Data and Information Science*, *2*(3), 1-18. DOI: https://doi.org/10.1515/jdis-2017-0011