Master of Science in Biomedical Data Science and AI

The Master of Science (MS) in Biomedical Data Science and AI is a 37-credit-unit program that offers excellent training in informatics, data science, and biostatistics for students who earned undergraduate or higher degrees with majors in Mathematics, Statistics, Computer Science, Biomedical Engineering, or other related fields. It prepares graduates for rewarding employment in academia and industry and for further graduate studies.

It offers three distinct concentrations, allowing students to tailor their training to align with their interests and career goals. After completing a shared first semester of foundational coursework, students select one of the following tracks to dive deeper into advanced topics: 1) Biostatistics; 2) Biomedical Informatics; or 3) Data Science. Each concentration equips students with the tools and perspectives needed to lead in the rapidly evolving landscape of healthcare, research, and artificial intelligence. Whether the student's passion lies in clinical applications, statistical research, or AI innovation, our program provides a robust and flexible pathway to success.

All students will participate in a practicum project that will have an option to transition into a thesis pathway. Each option requires a two-semester commitment in which students will earn 3 credit units per semester. We require a minimum of 150 hours per semester for the practicum and thesis components to ensure that students gain substantial and meaningful hands-on experience.

Core Courses (16 credit units)

Code	Title	Units
BDSAI 5001	R for Biomedical Sciences	1
BDSAI 5002	Python for Biomedical Sciences	1
BDSAI 5003	Introduction to Biomedical Data Science	2
BDSAI 5004	Introduction to Biomedical Informatics	2
BDSAI 5005	Fundamentals of Biostatistics	2
BDSAI 5006	Research Design for Biomedical Data Science	2
BDSAI 5301	Seminar Series for Biomedical Sciences	1
BDSAI 5302	Journal Club for Biomedical Sciences	1
BDSAI 5303	Scientific Communication for Biomedical Sciences	2
BDSAI 5304	Ethics for Biomedical Data Science	2
Total Units		**16**

Concentration Courses (6 credit units)

Biostatistics

Code	Title	Units
BDSAI 5131	Survival Analysis	3
BDSAI 5132	Statistical Analysis of Longitudinal Data	3

Biomedical Informatics

Students choose two of the following courses:

Code	Title	Units
BDSAI 5121	Electronic Health Records: Foundations	3
BDSAI 5122	Electronic Health Records Analytics	3
BDSAI 5123	Advanced Multi-Omic Modeling and Systems Analysis	3

Data Science

Code	Title	Units
BDSAI 5111	Data Visualization	3
BDSAI 5112	Advanced AI Topics in Biomedical Informatics: Deep Learning, Transformers, and Large Language Models	3

Experiential Learning (6 credit units)

Code	Title	Units
BDSAI 5901	Biomedical Data Science and AI Practicum	3
BDSAI 5902	Biomedical Data Science and AI Mentored Research	3

Elective Courses

All students will complete 9 credit units of electives. This structure provides flexibility, enabling students to customize their educational path while still benefiting from a broad knowledge base. Electives allow students to tailor their education to their specific interests in advanced topics within their field. Students receive guidance for making elective choices that best suit their study area.

Academic Policies

Academic policies for I^2DB degree programs can be found in the Student Handbook.

Prospective Students

Those interested in applying or who would like more information may contact the program recruiter (i2db-education@wustl.edu).

Washington University School of Medicine
Institute for Informatics, Data Science and Biostatistics (I^2DB)
660 S. Euclid Ave., MSC 8067-0013-05
St. Louis, MO 63110-1093

Contact Info