Master of Science in Biostatistics

The Biostatistics M.S. and Ph.D. programs were created to help meet the ever-increasing demand for biostatisticians to take leadership roles in careers as researchers and educators in academia, government, and industry. Our faculty members are active researchers who collaborate and consult on research projects and initiatives at the Medical Center while pursuing their own research agendas and participating in curricular instruction. Expertise within the Department includes linear, nonlinear, and longitudinal modeling, clinical trial and experimental design, survival analysis, categorical data analysis, statistical 'omics, bioinformatics, data integration, artificial intelligence, machine learning, computational statistics, and Bayesian methodology.

The M.S. program produces graduates who are prepared to apply biostatistical and epidemiology methodology for the design and analysis of public health and biomedical research investigations. Program graduates are well suited to function as collaborators on research projects in the biomedical and public health sciences.

Graduates of the Biostatistics M.S. program will be able to:

1. Demonstrate a comprehensive knowledge and understanding of statistical practice as applicable in the health sciences.
2. Function as a collaborator or co-investigator on a research team.
3. Take a leadership role in the design and implementation of health science projects.
4. Assume responsibility for the design and implementation of analyses for health science investigations.
5. Assist with the design and implementation of data management systems for large health science studies.
6. Prepare reports and publications resulting from the analyses for health science studies.
7. Communicate the principles of statistics and analytics with their peers with varying statistical backgrounds.
8. Serve as an advocate for good statistical design in health science investigations.

The application process for the M.S. in Biostatistics is an online process. Detailed instructions on how to apply are posted on the Department of Biostatistics & Data Science (https://www.kumc.edu/school-of-medicine/academics/departments/biostatistics-and-data-science/academics/master-of-science-in-biostatistics/admissions.html) website.

Admission Requirements:

- A bachelor's degree in statistics, biostatistics, mathematics, data science, or other related fields from a regionally accredited institution documented by submission of an official transcript indicating the degree has been conferred before entering the program. Official transcripts from institutions attended post-baccalaureate are also required.
    - Students with degrees from outside the U.S. may be subject to transcript evaluation indicating the degree is equivalent to a U.S. degree and meets the minimum cumulative GPA requirements.
- A cumulative grade-point average (GPA) of at least a 3.0 on a 4.0 scale for the bachelor's degree.

- Applicants who are not native speakers of English, whether domestic or international, must demonstrate they meet the Minimum English Proficiency Requirement.
- A background check is required during the admission process; it may affect the student's eligibility to enter the program.
- An official copy of the Graduate Record Examination (GRE) score sent from Educational Testing Service (ETS) to University of Kansas Medical Center - ETS institutional 6895.
- Letter grade of B or better in Calculus I, II, & III (or the equivalent).
- Successful completion of at least one of the following courses: linear algebra, differential equations, numerical analysis.
- Successful completion of a course in any computer programming language or demonstration of mastery via credentials or work experience.
- Research experience (beyond labs associated with lecture courses) is recommended but not required.
- Contact information for three references who are familiar with the applicant's work and character and who have agreed to write letters of recommendation.
- A current resume or curriculum vitae.
- A personal statement regarding your interest in biostatistics and in biomedical research.
- A personal interview is required of all applicants who meet the minimum admissions standards.

Applicants will be assessed based on these requirements.

After an applicant has been admitted, a program may defer an applicant's admission for one year after which time the applicant must submit a new application.

Admission requirements are subject to change. In most cases, use the catalog of the year student entered the program. *Other years' catalogs».*

The M.S. in Biostatistics degree program consists of 36 credit hours including collaborative research experience, annual evaluations, and the successful completion of the master's general examination. The course plan consists of 27 credit hours from required biostatistics core courses which includes 3 credit hours of Collaborative Research Experience. This requirement ensures the completion of a research component through collaborative effort within or external to the department. Students also complete 9 credit hours of elective coursework.

Degree requirements:

- Degree requirements are normally completed within 2 years of admission to the program although a maximum of 7 years is allowed.

- Completion of a minimum of 36 credit hours.

- Cumulative grade-point average (GPA) of at least a 3.0 for all KU graduate coursework.

- Enrollment in a minimum of one credit hour the semester the student will graduate.

- Successful completion of a general examination (https://catalog.ku.edu/graduate-studies/kumc/#ThesisDefense) the semester the student will graduate. The general examination is given upon completion of the following courses: BIOS 830, BIOS 835, BIOS 840, BIOS 871, BIOS 872, and BIOS 900. The examination has three purposes: to assess the student's strengths and weaknesses; to determine whether the student should be awarded the M.S. degree;

and, if it is a degree goal, to determine whether the student is prepared to continue into the Ph.D. program (https://catalog.ku.edu/medicine/biostatistics/phd/).

- Successful completion of the following Biostatistics courses:

Code	Title	Hours
BIOS 805	Professionalism, Ethics and Leadership in the Statistical Sciences	3
BIOS 820	SAS Programming I	3
BIOS 830	Experimental Design	3
BIOS 835	Categorical Data Analysis	3
BIOS 840	Linear Regression	3
BIOS 871	Mathematical Statistics	3
BIOS 872	Mathematical Statistics II	3
BIOS 898	Collaborative Research Experience	3
BIOS 900	Linear Models	3

- Successful completion of a minimum of 9 credit hours of elective coursework, including a minimum of 6 credit hours of elective coursework from courses offered by the department. Specific courses are determined in consultation with the student's advisor.
- Students may take up to 12 credit hours of equivalent coursework under the STAT or HDSC prefix. Course equivalence should be determined in consultation with the student's advisor.
- Regular attendance at the Department Journal Club and Seminar Series is required.

Degree requirements and course descriptions are subject to change. Any courses taken as an equivalent must be approved by the Graduate Director and the Office of Graduate Studies. In most cases, use the catalog of the year student entered the program. *Other years' catalogs».*

Annual Evaluations:

Students are evaluated each May by their graduate advisors and the director of the graduate program. These evaluations provide feedback to the student regarding the progress they are making in meeting program requirements, classroom performance, and research performance.

Typical Plan of Study

Year 1

Fall	Hours	Spring	Hours	Summer	Hours
BIOS 820	3	BIOS 830	3	BIOS 805	3
BIOS 840	3	BIOS 872	3		
BIOS 871	3	Elective	3		
	9		**9**		**3**

Year 2

Fall	Hours	Spring	Hours		
BIOS 835	3	BIOS 898	3		
BIOS 900	3	Elective	3		
Elective	3	General Exam may be scheduled beginning of the Spring semester if approved by advisor to proceed.			
	9		**6**		

Total Hours 36

- Students may take up to 12 credit hours of equivalent coursework under the STAT, DATA, or HDSC prefix. Course equivalence should be determined in consultation with the student's advisor.
- Successful completion of any elective coursework as determined in consultation with the student's advisor. Any coursework under the STAT, DATA, or HDSC prefixes may be considered as internal elective credit.

Because the M.S. and Ph.D. in Biostatistics degrees signify that the holder is prepared for entry into the practice of biostatistics research, it follows that graduates must have the knowledge and skills necessary to function in a broad range of academic and research situations. The **Technical Standards** include those physical, cognitive, and behavioral standards that are required for the satisfactory completion of all aspects of the curriculum and the development of professional attributes required by all students at graduation. Therefore, the following abilities and expectations must be met by all students **with or without accommodations** admitted to the M.S. and Ph.D. programs:

1. **Observation.** A student must be able to observe and evaluate class demonstrations and field experiences relevant to the field of statistics. He or she must be able to read and comprehend text, numbers, tables and graphs, both in print and displayed electronically. Observation necessitates the functional use of the senses of vision and hearing.

2. **Communication.** A student must be able to communicate effectively and efficiently in English in oral, written, and electronic form with other students, faculty, staff, researchers, and the public. Effective communication includes: the ability to understand assigned readings, lectures, and technical and professional materials; the ability to analyze information; the ability to present results of such analyses verbally and in writing; the ability to independently prepare papers and presentations; and the ability to follow verbal and written instructions. Use of computers and other technology is imperative to this communication.

3. **Motor.** A student must have sufficient motor function to attend classes, prepare assignments, use electronic media, deliver lectures and make public presentations. Class requirements may also include field work in a variety of collaborative environments.

4. **Intellectual, conceptual, integrative and quantitative abilities.** A student must possess the ability to understand and read and understand documents written in English, to understand and work with measurements and calculations, and to engage in reasoning, analysis, synthesis and critical thinking. A student must be able to exercise sufficient judgment to recognize and correct performance deviations, and be able to draw on all the above mentioned abilities to be an effective problem solver, researcher, and communicator.

5. **Behavioral and social attributes.** A student must have the emotional health required for the full use of his or her intellectual ability. A student must be able to exercise sound judgment, and to act ethically and

with integrity. He or she must develop mature, sensitive, and effective professional relationships with others. A student must be self-motivated, reliable and responsible to complete assigned tasks in a timely manner with no supervision. Students must be able to give attention to detail and have the flexibility to function in a research setting, including adapting to changes in time, place and structure of academic and research settings. The student must have the ability to work with diverse groups.

NOTE: Reasonable accommodations will be considered and may be made to qualified students who disclose a disability, so long as such accommodation does not significantly alter the essential requirements of the curriculum and the training program, or significantly affect the safety of patient care. Students who disclose that they have a disability are considered for the program if they are otherwise qualified. Qualified students with a disability who wish to request accommodations should provide the appropriate documentation of disability and submit a request for accommodation to the University's Office for Academic Accommodations.