

Program Approval

I. General Information

A. Institution University of Kansas

B. Program Identification

Degree Level:	Bachelor's
Program Title:	Statistics
Degree to be Offered:	Bachelor of Science
Responsible Department or Unit:	Department of Mathematics
CIP Code:	27.0501
Modality:	Face-to-Face
Proposed Implementation Date:	Spring 2026

Total Number of Semester Credit Hours for the Degree: 120

II. Clinical Sites: Does this program require the use of Clinical Sites? No

III. Justification

The B.S. in Statistics is aimed at students who desire to obtain rigorous training in Statistics to pursue careers that heavily utilize Statistics, or who are interested in continuing into graduate level studies of Statistics and its applications. As collecting and analyzing data is ubiquitous in about every human activity, statisticians can find employment in many areas of finance and corporate banking, data analytics and data science, medicine, actuarial science, insurance and business analytics, geological and atmospheric sciences, or government. This program will provide students with an interest in pursuing such jobs with an explicitly marketable degree and a set of technical skills with which to pursue those careers.

Additionally, the proposed B.S. in Statistics will address an unmet demand from the perspective of KU students. Currently, KU does not offer a mathematically rigorous, technically intensive undergraduate STEM oriented degree program in Statistics. The Department of Mathematics at KU is well positioned to meet this need.

IV. Program Demand: Market Analysis

Currently the only public university in Kansas that offers a Bachelor of Science or Bachelor of Arts degree with the same CIP Code is K-State, which is offered by the Department of Statistics. Conversely, all but one (University of Oregon) of KU's Peer Universities¹, has a program that offers either a B.A. or a B.S. in Statistics. The fact that all the other peer institutions have sustainable degree programs in Statistics indicates the viability of such a program at KU. Undergraduate programs also exist in Nebraska, Colorado, Oklahoma, and Missouri.

Additionally, the proposed B.S. in Statistics is designed as a multidisciplinary undergraduate program that will provide students not only with a solid mathematical foundation in statistical sciences, but also the opportunity to gain experience about important applications of statistics from other natural science, social science, business, and engineering departments. As one of only 187 institutions in the country classified with the highest-level research spending and doctoral production, and as the home of several nationally ranked Engineering and STEM programs, as well as proximity to both Kansas City and Topeka, KU is in an ideal position to offer such a statistics degree program.

¹ As approved by KBOR in 2013.

A trend analysis of fifty institutions, based on Lightcast (2024) data indicates that the BS in Statistics remains in demand with long-term growth visible over an 11-year period (2012-2023). Nationwide, the degree has seen a remarkable 200% increase in completions from 1,139 in 2012 to 3,418 in 2023 (Lightcast, 2024).

BS in Statistics graduates are highly sought after in several occupations, including data scientists, natural sciences managers, mathematical science occupations, actuaries, statisticians, survey researchers, statistical assistants, and mathematicians (Lightcast, 2024). As of 2023-2024, there were 158,000 job postings relevant to BS in Statistics graduates, marking a 4.3% increase in job postings. Additionally, all targeted occupations have experienced growth in annual openings, ranging from 0.89% to as high as 5.64% (Lightcast, 2024).

V. Projected Enrollment for the Initial Three Years of the Program

Year	Total Headcount Per Year		Total Sem Credit Hrs Per Year	
	Full- Time	Part- Time	Full- Time	Part- Time
Implementation	5	0	150	0
Year 2	10	0	300	0
Year 3	20	0	600	0

VI. Employment

Students with degrees in Statistics are well positioned to take jobs as either Statisticians or Data Scientists. According to the Bureau of Labor Statistics (BLS), there were 34,800 jobs as a Statistician in 2023, and the expected job growth between 2023-2033 is 11% (U.S. Department of Labor, n.d.). This is designated as “much faster than average”. Further, the BLS indicates there were 202,900 jobs in Data Science in 2023, and the expected job growth between 2023-2033 is 36% (U.S. Department of Labor, n.d.). Again, this is designated as much faster than average.

In addition, according to the US Department of Labor’s Occupational Information Network (O*NET), both “Statistician” and “Data Scientist” are considered “Bright Outlook” occupations, which is said to indicate occupations that are expected to grow rapidly in the next several years, will have a large number of job openings, or are new and emerging occupations (O*NET Online, n.d.).

VII. Admission and Curriculum

A. Admission Criteria

Qualified Admission criteria are used, as the program does not have separate admission requirements.

B. Curriculum

The curriculum below shows students enrolled in Calculus I that is aligned to the KBOR Math & Statistics Discipline Area for general education. Students who instead start in College Algebra the first semester are still able to complete the degree in four years with 120 credit hours.

Year 1: Fall SCH = Semester Credit Hours

Course #	Course Name	SCH=15
ENGL	KBOR English Discipline Area	3
S&BS	KBOR Core Social & Behavioral Science Discipline Area	3
	KBOR Natural & Physical Science Designated Area	4
MATH 125	KBOR Mathematics & Statistics Discipline Area Calculus I	5

Year 1: Spring

Course #	Course Name	SCH=17
ENGL	KBOR English Discipline Area	3
COMS	KBOR Communications Discipline Area	3
EECS 138, EECS 168 or EECS 169	Introduction to Computing Programming I Programming I: Honors	3
MATH 126	Calculus II	5
	Elective	3

Year 2: Fall

Course #	Course Name	SCH=16
A&H	KBOR Arts & Humanities Discipline Area	3
S&BS	KBOR Core Social & Behavioral Science Discipline Area	3
MATH 127	Calculus III	5
MATH 290	Elementary Linear Algebra	2
	Elective	3

Year 2: Spring

Course #	Course Name	SCH=15
A&H	KBOR Arts & Humanities Discipline Area	3
	KBOR Core Institutional Designated Area	3
MATH 627	Probability	3
	Elective	3
	Elective	3

Year 3: Fall

Course #	Course Name	SCH=15
	KBOR Core Institutional Designated Area	3
	Course from MathStats List	3
	Course from MathStats/ApplStats List	3
MATH 628	Mathematical Theory Statistics	3
	Elective	3

Year 3: Spring

Course #	Course Name	SCH=15
	Course from MathStats List	3
	Elective	3
	Elective	3
	Elective	3
	Elective	3

Year 4: Fall

Course #	Course Name	SCH=15
	Course from MathStats/ApplStats List	3
	Elective	3
	Elective	3
	Elective	3
	Elective	3

Year 4: Spring

Course #	Course Name	SCH=12
	Elective	3
MATH 690	Capstone in Statistics	3
	Elective	3
	Elective	3

Total Number of Semester Credit Hours **120**

VIII. Core Faculty

Note: * Next to Faculty Name Denotes Director of the Program, if applicable

FTE: 1.0 FTE = Full-Time Equivalency Devoted to Program

Faculty Name	Rank	Highest Degree	Tenure Track Y/N	Academic Area of Specialization	FTE to Proposed Program
Tyrone Duncan	Professor	Ph.D.	Y	Probability & Statistics	1.0
Jin Feng	Professor	Ph.D.	Y	Stochastic Analysis	1.0
Weizhang Huang	Professor	Ph.D.	Y	Computational Mathematics	0.25
Zhipeng Liu	Professor	Ph.D.	Y	Probability / Math Physics	1.0
Myunghyun Oh	Assoc. Prof.	Ph.D.	Y	Applied Math	0.25
Joonha Park	Asst. Prof.	Ph.D.	Y	Statistics	1.0
Bozena Pasik-Duncan	Professor	Ph.D.	Y	Statistics / Stochastic Control	1.0
Zsolt Talata	Assoc. Prof.	Ph.D.	Y	Statistics	1.0
Erik Van Vleck	Professor	Ph.D.	Y	Applied Math / Comp. Math	0.25

Number of graduate assistants assigned to this program **1**

IX. Expenditure and Funding Sources

A. EXPENDITURES	First FY	Second FY	Third FY
Personnel – Reassigned or Existing Positions			
Faculty	\$45,000	\$140,040	\$241,250
Administrators (<i>other than instruction time</i>)	0	0	0
Graduate Assistants	\$10,500	\$10,710	\$22,000
Support Staff for Administration (<i>e.g., secretarial</i>)	0	0	0
Fringe Benefits (<i>total for all groups</i>)	\$15,240	\$45,670	\$78,960
Other Personnel Costs	0	0	0
Total Existing Personnel Costs – Reassigned or Existing	\$70,740	\$196,420	\$342,210
Personnel – New Positions			

Faculty	0	0	0
Administrators (<i>other than instruction time</i>)	0	0	0
Graduate Assistants	0	0	0
Support Staff for Administration (<i>e.g., secretarial</i>)	0	0	0
Fringe Benefits (<i>total for all groups</i>)	0	0	0
Other Personnel Costs	0	0	0
Total Existing Personnel Costs – New Positions	0	0	0
Start-up Costs - One-Time Expenses			
Library/learning resources	0	0	0
Equipment/Technology	0	0	0
Physical Facilities: Construction or Renovation	0	0	0
Other	0	0	0
Total Start-up Costs	0	0	0
Operating Costs – Recurring Expenses			
Supplies/Expenses	0	0	0
Library/learning resources	0	0	0
Equipment/Technology	0	0	0
Travel	0	0	0
Other	0	0	0
Total Operating Costs	0	0	0
GRAND TOTAL COSTS	\$70,740	\$196,420	\$342,210

B. FUNDING SOURCES (<i>projected as appropriate</i>)	Current	First FY (New)	Second FY (New)	Third FY (New)
Tuition / State Funds		\$90,125	\$180,251	\$360,504
Student Fees		\$1,500	\$3,000	\$6,000
Other Sources		0	0	0
GRAND TOTAL FUNDING		\$91,625	\$183,251	\$366,504
C. Projected Surplus/Deficit (+/-) (Grand Total Funding <i>minus</i> Grand Total Costs)		\$20,885	-\$13,169	\$24,294

X. Expenditures and Funding Sources Explanations

A. Expenditures

Personnel – Reassigned or Existing Positions

Existing Math faculty members will teach the required core curriculum and a rotation of Math electives that can count towards the Statistics electives. These courses will be taught as part of their regular course load in Math. The number of Math faculty teaching courses will be limited to two courses in the first year, but FTE dedicate to teaching courses in the degree will ramp up in years two and three as the initial cohort progresses through the curriculum and new students enroll in the degree.

One Math GTA from the currently funded Math GTA pool will assist with large Math sections each year.

Personnel – New Positions

No new positions will be required to teach the core curriculum or electives required for the degree.

Start-up Costs – One-Time Expenses

None

Operating Costs – Recurring Expenses

None

B. Revenue: Funding Sources

The Statistics degree will be fully funded through standard tuition and fee revenue. AY 2024-2025 standard tuition for Lawrence Campus students is \$365.60 per credit hour for resident students and \$976.60 per credit hour for non-resident students. Consistent with the overall undergraduate student credit hour distribution on the Lawrence campus, it is estimated that 61.5% of student credit hours will be from resident students and 38.5% from non-resident students, and revenue projections from base tuition were calculated using a weighted average of \$600.84 per credit hour. Student fees were calculated based on the \$10 per credit hour course fee for CLAS effective Fall 2024.

C. Projected Surplus/Deficit

Year 1: \$20,885

Year 2: -\$13,169

Year 3: \$24,294

XI. References

Bureau of Labor Statistics, (n.d.) *Occupational Outlook Handbook, Mathematicians and Statisticians*, U.S. Department of Labor. Retrieved March 17, 2025, from <https://www.bls.gov/ooh/math/mathematicians-and-statisticians.htm>.

Bureau of Labor Statistics, (n.d.) *Occupational Outlook Handbook, Data Scientists*, U.S. Department of Labor. Retrieved March 13, 2025, from <https://www.bls.gov/ooh/math/data-scientists.htm>.

Lightcast Report. Program Overview; Data Analytics. Lightcast Q3 2024 Data Set. September 2024.

O*NET Online (n.d.). *Statisticians, 15-2041.00*. Retrieved April 11, 2025, from <https://www.onetonline.org/link/summary/15-2041.00>

O*NET Online (n.d.). *Data Scientists, 15-2051.00*. Retrieved April 11, 2025, from <https://www.onetonline.org/link/summary/15-2051.00>

Attachment

List of MathStats and ApplStats Courses

A. List MathStats Courses

Dept	Code	Title	Hours
Mathematics	<u>MATH 582</u>	Computational Data Science	3
Mathematics	<u>MATH 605</u>	Applied Regression Analysis	3
Mathematics	<u>MATH 608</u>	Statistical Data Science	3
Mathematics	<u>MATH 624</u>	Discrete Probability	3
Mathematics	<u>MATH 630</u>	Actuarial Mathematics	3
Mathematics	<u>MATH 717</u>	Nonparametric Statistics	3
Mathematics	<u>MATH 727</u>	Probability Theory	3
Mathematics	<u>MATH 728</u>	Statistical Theory	3
Mathematics	<u>MATH 750</u>	Stochastic Adaptive Control	3

B. List ApplStats Courses

Department	Code	Title	Hours
Aerospace Engineering	<u>AE 768</u>	Orbit Determination	3
Biology	<u>BIOL 370</u>	Introduction to Biostatistics	4
Business	<u>BSAN 415</u>	Data Analysis and Forecasting	3
Business	<u>BSAN 450</u>	Data Mining and Predictive Analytics	3
Civil, Envr, & Arch Engineering	<u>CE 711</u>	Probabilistic Design and Reliability	3
Civil, Envr, & Arch Engineering	<u>CE 760</u>	Stochastic Hydrology	3
Economics	<u>ECON 526</u>	Introduction to Econometrics	3
Economics	<u>ECON 715</u>	Elementary Econometrics	3
Economics	<u>ECON 716</u>	Econometric Forecasting	3

Electrical Engr & Computer Science	<u>EECS 563</u>	Introduction to Communication Networks	3
Electrical Engr & Computer Science	<u>EECS 658</u>	Introduction to Machine Learning	3
Electrical Engr & Computer Science	<u>EECS 769</u>	Information Theory	3
Educational Psychology	<u>EPSY 710</u>	Introduction to Statistical Analysis	3
Geography	<u>GEOG 716</u>	Advanced Geostatistics	3
Geology	<u>GEOL 504</u>	Inverse Problems for Geoscientists	3
Mechanical Engineering	<u>ME 788</u>	Optimal Estimation	3
Physics & Astronomy	<u>PHSX 615/</u> <u>EPHX 615</u>	Numerical & Computational Methods in Physics	3
Physics & Astronomy	<u>PHSX 616/</u> <u>EPHX 616</u>	Physical Measurements	4
Physics & Astronomy	<u>PHSX 671/</u> <u>EPHX 671</u>	Thermal Physics	3
Psychology	<u>PSYC 500</u>	Intermediate Statistics in Psychological Research	3
Psychology	<u>PSYC 599</u>	Data III: Data Management	3
Psychology	<u>PSYC 612</u>	Data IV: Introduction to Machine and Statistical Learning	3
Psychology	<u>PSYC 699/</u> <u>POLS 699</u>	Community Data Lab	3