

2023 - 2024

# GRADUATE PROGRAM STUDENT HANDBOOK

## Health Data Science

This handbook can be found online at:

<https://www.kumc.edu/school-of-medicine/academics/departments/biostatistics-and-data-science/academics/resources-for-students.html>

# University of Kansas Medical Center Biostatistics & Data Science Graduate Program

## Student Handbook Acknowledgment Form

I, \_\_\_\_\_, have reviewed and read the **Department of Biostatistics & Data Science Graduate Program Student Handbook**. I understand that as a graduate student at the University of Kansas, I am expected to uphold the program's policies and that failure to do so may result in disciplinary action.

I understand that as the Department of Biostatistics & Data Science programs evolve over time, policies may be amended and/or added. I will be informed of such changes as they take effect, as well as annually at the beginning of the Fall Semester.

I also understand that should I have any problems or questions regarding the policies as they are presented in this handbook, I may direct them to the Biostatistics & Data Science Program Director or Coordinator.

\_\_\_\_\_(Signature)

\_\_\_\_\_(Date)

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# Letter from the Chair

Dear Student,

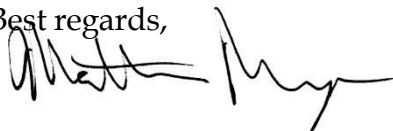
On behalf of the faculty and staff, welcome to the Department of Biostatistics & Data Science Graduate Program. We're glad you're here and we're pleased that you have chosen to pursue a career in biostatistics.

The following information is designed to serve as an introduction to the Department of Biostatistics & Data Science Graduate Programs and provide information on resources here at the University of Kansas Medical Center that will serve to assist you in making a smooth transition into student life. Throughout the coming year, we'll be taking an exciting journey together as we enhance our master and doctoral programs. We'll all be doing some hard but rewarding work in the classroom and in the field. Keep in mind, this journey may not be an easy one. We will all be challenged to work in new and different ways, and will be asked to stretch in order to increase our knowledge and skills.

In closing, please remember that the faculty, staff and I are here to assist you in succeeding in this phase of your career. We want you to succeed, both here and wherever your career path leads. Do not hesitate to call on us when you need assistance – that is what we are here for.

Again, welcome to the Department of Biostatistics & Data Science. May you each have a rewarding and productive year ahead.

Best regards,



Matthew S. Mayo, PhD, MBA  
Professor and Founding Chair, Department of Biostatistics & Data Science  
Associate Director for Shared Resources, The University of Kansas Cancer Center  
The University of Kansas Medical Center



# Biostatistics & Data Science Contact Information

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## KUMC Campus Programs

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## Edwards Campus Programs

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## **MS and PhD Programs in Biostatistics**

Biostatistics is the exciting and rapidly-growing field of the development and application of statistical methods to research in health-related fields, including medicine, public health, and biology. Biostatisticians play essential roles in designing the studies, analyzing data, disseminating findings, and creating new methods for addressing problems.

As science progresses and new ways to measure and collect information become possible, new statistical techniques must be developed. With the breathtaking pace of science today, the skills of biostatisticians are especially in demand because of new advances in fields such as genetics and neuroimaging, and in the ability to collect, store, and manage vast amounts of data.

Our MS & PhD programs were created to help meet the ever-increasing demand for biostatisticians needed to take leadership roles in careers as researchers and educators in academia, government, and industry. The course work, seminars and collaborative research experience have been designed so that our graduates acquire the knowledge and expertise that allow them to work at the frontier of their field.

Our faculty members are active researchers collaborating and consulting in research projects and initiatives throughout the Medical Center, in addition to pursuit of their own research agendas and participation in curricular instruction. Expertise in the department includes linear, nonlinear, and longitudinal modeling, clinical trial, experimental design, survival analysis, categorical data analysis, robust statistics, psychometric methods, statistical genomics, and Bayesian methodology.

## **Individual Development Plans (IDPs)**

Individual Development Plans (IDPs) provide a planning process that identifies both professional development needs and career objectives. Furthermore, IDPs can serve as a tool to help facilitate communication between trainees and their mentors. IDPs start generically by emphasizing skills necessary for diverse career paths and become more individualized as the career goals of the individual student change and materialize over the course of their graduate career.

Students will receive an IDP form at the beginning of their program. The form should be completed once per year and reviewed with the student by the academic advisor.

# MS in Health Data Science

## Program Overview

With the rising emphasis on highly personalized data in health care, pharmaceutical, insurance, and other organizations, so rises the need for health data scientists. The U.S. Bureau of Labor Statistics estimates a 31 percent growth in jobs for data scientists over the next 10 years (2019-2029) and reports a current median salary of \$124,100 for data scientists. Our program will bring statistics and data science together with a focus on health data. This combination of skill sets is highly sought after and is required in many healthcare institutions and industries.

The MS in HDSC typically compliments prior education and careers in:

- Pharmaceutical Industry
- Health Care
- Insurance company
- Consulting
- Education
- Health analytics
- Health research
- Government
- Biotechnology

Fortune magazine ranked statistics and biostatistics among the top graduate degrees in 2015 and 2016 based on salary, growth and job satisfaction. Graduating with this degree will open new door to a more rewarding career.

## Degree Requirements

The program consists of 36 credit hours including annual evaluations and the successful completion of the Masters Comprehensive Examination.

### Course Plan

The typical course plan consists of 30 credit hours from required Health Data Science core courses which includes 3 foundational course sections: Statistics Foundation, Computing Foundation, and Health Data Science Foundation.

A minimum of 6 credit hours in Elective courses is also required.

### Required Statistics Foundation Courses (12 credit hours)

- HDSC 805 Professionalism, Ethics, and Leadership in the Statistical Sciences (3 credit hours)
- HDSC 835 Categorical Data Analysis (3 credit hours)
- HDSC 840 Linear Regression (3 credit hours)
- HDSC 845 Survival Analysis (3 credit hours)

### Required Computing Foundation Courses (6 credit hours)

- HDSC 818 Introduction to R (1 credit hour)
- HDSC 819 Introduction to Python (1 credit hour)
- HDSC 822 Introduction to SQL (1 credit hour)
- HDSC 823 Introduction to Programming and Applied Statistics in R (3 credit hours)

### Required Health Data Science Foundation Courses (12 credit hours)

- HDSC 824 Data Visualization and Acquisition (3 credit hours)
- HDSC 880 Data Mining and Analytics (3 credit hours)
- HDSC 881 Statistical Learning I (3 credit hours)
- HDSC 861 Observational Health Data Analytics (3 credit hours)

### Elective Courses (6 credit hours)

- HDSC 815 Introduction to Bioinformatics
- HDSC 817 Introduction to Tableau
- HDSC 820 SAS Programming I
- HDSC 821 SAS Programming II
- HDSC 830 Experimental Design
- HDSC 833 Measurements for Statisticians
- HDSC 855 Statistical Methods in Genomic Research
- HDSC 871 Mathematical Statistics I
- HDSC 872 Mathematical Statistics II
- HDSC 882 Statistical Learning II
- HDSC 883 Processing and Analysis of Medical Information Systems



## Annual Evaluations

Students will be evaluated each May by their faculty advisor and Program Chair. These evaluations provide feedback to the student regarding the progress that they are making towards the degree. To proceed in the program, students must remain in good standing and maintain a 3.0 GPA with no more than two grades of C in the required courses.

## Graduate Examinations

*Qualifying Examination:* The Qualifying Examination is given during the final semester of enrollment, ensuring the completion of the following courses: Categorical Data Analysis, Linear Regression, Statistical Learning I, and Observational Health Data Analysis. Passing of the Qualifying Examination as a MS requirement applies. The examination has two purposes: to assess the student's strengths and weaknesses and to determine whether the student should be awarded the MS degree.

## Academic grade standards for MS students

Good academic standing requires maintaining a GPA of at least 3.0 with no letter grade below a C and no more than two HDSC courses with a C letter grade. Students who do not maintain good academic standing will undergo review by the Director of Graduate Education and the Department Chair. If at any time a student receives a letter grade below a C or 3 or more letter grades at a C or below they will be formally removed from the program. If they receive one or two letter grades of a C and their GPA is below 3.0, they will be placed on departmental academic probation and will have their status reviewed at the end of the following semester. If they receive one or two letter grades of a C and their GPA is at or above a 3.0 they will remain in good standing.

**GRA/GTA:** Good academic standing requires maintaining a GPA of at least 3.0 with no letter grade of C or below in all HDSC courses. Graduate Assistants who do not maintain good academic standing will have their position terminated. At the request of the student, the Director and Department Chair can evaluate the student's performance at the end of the following semester to determine reinstatement of the position. Reinstatement will occur no sooner than one academic semester after position termination.

# Health Data Science Course Catalog

## *HDSC 805 Professionalism, Ethics and Leadership in the Statistical Sciences (3)*

This web-based course addresses issues in professionalism, leadership and ethics that are specific to students training to become statisticians, biostatisticians, and data scientists. Topics include use of sound statistical methodology, common threats to valid inference, effective communication and collaboration with content-area experts, maintaining transparency and independence, reproducible research, the publishing process (including authorship guidelines, plagiarism, peer review, intellectual property, etc.), conflict of interest, data security, and properties of effective leaders, among others. Prerequisite: Department consent.

## *HDSC 815 Introduction to Bioinformatics (3)*

Bioinformatics, an interdisciplinary field at the cross-section of biology, computer science, and statistics, has played a key role in enhancing our understanding of many areas of biology. The broad purpose of this course is to introduce students in the quantitative sciences to the field of bioinformatics and its practice. Topics include foundational concepts in molecular biology, biological databases, sequence alignment, BLAST, molecular phylogenetics, genomics, transcriptomics, proteomics, microbiomics, with treatment of the accompanying bioinformatic tools/methodologies that have been developed to analyze such data types. Over the semester, students will gain a familiarity with the essential concepts and theories underlying the practice of bioinformatics, different types of 'omic data, the technologies used to generate different 'omic data types, and databases and tools commonly used for bioinformatics analysis. Prerequisite: There are no formal prerequisites for this course. Previous graduate-level coursework in probability and statistics and molecular biology is helpful, but not necessary.

## *HDSC 817 Introduction to Tableau (1)*

Under Tableau Desktop-I specialization, the student will discover what data visualization is, and how to use it use to better display and understand the information within a data set. Using Tableau, this course will examine the fundamental concepts of data visualization and explore the Tableau Desktop interface, identifying and applying the various tools Tableau has to offer. By the end of the course, students will be able to prepare and import data into Tableau and explain the relationship between data analytics and data visualization. This course is designed for learners who have never used Tableau before, those in need of a refresher, or those wanting to explore Tableau in more depth. No prior technical or analytical background is required. The course will guide students through the steps necessary to create visualization dashboard and story from the beginning based on data context, setting the stage for students to be ready for Desktop-I certification. Prerequisite: There are no formal prerequisites for this course. Prior experience generating plots, tables, graphs, etc. is helpful, but is not required.

## *HDSC 818 Introduction to R (1)*

This course will provide students with the opportunity to learn applied statistics using R statistical programming language.

## *HDSC 819 Introduction to Python (1)*

This is a one credit hour introduction course to programming in Python. The fundamentals of Python programming, including introduction to Python syntax, types, data structures, control of flow, functions, modules and packages, reading and writing files, and basic statistics will be covered throughout the course.

### *HDSC 820 SAS Programming I (3)*

This is a graduate level course preparing a student for the SAS base programming certification exam. We will cover the topics required for a student to pass the SAS base programming certification exam given by SAS. To this end, topics we will study will include, referencing files and setting options, creating list reports, understanding data step processing, creating and managing variables, reading and combining SAS data sets, do loops, arrays, and reading raw data from files. After the completion of the course the student should be able to create SAS programs to read data from external files, manipulate the data into variables to be used in an analysis, generate basic reports showing the results. Prerequisite: Permission of the Instructor.

### *HDSC 821 SAS Programming II (3)*

Students will learn to manipulate data, perform matrix operations, generate reports, etc., using Proc SQL and Proc IML. Prerequisite HDSC 820 or by permission of instructor.

### *HDSC 822 Introduction to SQL (1)*

This course prepares students to interact with most dialects of Structured Query Language (SQL). At the conclusion of the course, students will be prepared to interact with any major database, including PostgreSQL, MySQL, Oracle, among others. Topics covered relational databases, structure of data, Data Definition Language (DDL), Data Manipulation Language (DML), table joins, data summarization, and writing and interpreting SQL queries.

### *HDSC 823 Introduction to Programming and Applied Statistics in R (3)*

This course will provide students with the opportunity to learn advanced statistical programming. The development of new statistical or computational methods often implies the development of programming codes to support its application. Much of this type of development is currently carried out in the R (or S-Plus) language. Indeed much of the recent development of statistical genetics is based on the R programming language and environment. This course provides an introduction to programming in the R language and its applications to applied statistical problems. Prerequisite: Corequisite: Some previous exposure to computer programming. Some basic statistics at the Applied Regression or Applied Design level and permission of instructor.

### *HDSC 824 Data Visualization and Acquisition (3)*

Being a data scientist requires an integrated skill set that spans the domains of statistics, machine learning, and computer programming. It also demands a solid foundation in the principles of data visualization in order to create effective data presentations that convey the intended message. Put simply, data visualization describes any effort to assist an individual's understanding of the significance of data by placing it in a visual context. In this course, students will be introduced to principles of effective data visualization and tools commonly used for its implementation. Techniques and strategies for visualizing different types of data (e.g., numeric data, non-numeric data, spatial-temporal data, etc.), the use of space and color to visually encode data, interactive visualizations, acquiring and visualizing data from publicly available data repositories, data cleaning and standardizing, are examples of some of the topics this course will address. The focus in the treatment of these topics will be on breadth, rather than depth, and emphasis will be placed on integration and synthesis of concepts and their application to solving problems. Prerequisite: While there are no formal prerequisites for this course, students should have a basic familiarity with the R statistical programming language (HDSC 823 highly recommended). Prior experience using statistical software (e.g., R) to generate plots, tables, graphs, etc. is helpful, but is not required.

### *HDSC 830 Experimental Design (3)*

The emphasis of this course is on learning the basics of experimental design and the appropriate application and interpretation of statistical analysis of variance techniques. Prerequisite: By permission of instructor; HDSC 820 recommended.

### *HDSC 833: Measurement for Statisticians (3)*

This course aims to introduce the theory and applications of measurement and psychometrics to students in the statistical sciences. The goal is for students to master the concepts of measurement theory, classical/modern test theory, reliability and validity, factor analysis, structural equation modeling, item response theory, and differential item functioning. Corequisite: HDSC 835, or by permission of instructor.

### *HDSC 835 Categorical Data Analysis (3)*

This course provides an understanding of both the mathematical theory and practical applications for the analysis of data for response measures that are ordinal or nominal categorical variables. This includes univariate analysis, contingency tables, and generalized linear models for categorical response measures. Regression techniques covered for categorical response variables, such as logistic regression and Poisson regression methods, will include those categorical and/or continuous explanatory variables, both with and without interaction effects. Prerequisite: By permission of instructor; HDSC 820 or HDSC 823 and HDSC 840 are recommended.

### *HDSC 840 Linear Regression (3)*

This course is an introduction to model building using regression techniques. We will cover many of the popular topics in Linear Regression including: simple linear regression, multiple regression, model selection and validation, diagnostics and remedial measures. Prerequisite: By permission of the instructor.

### *HDSC 845 Survival Analysis (3)*

This course provides an understanding of both the mathematical theory and practical applications for the analysis of time to event data with censoring. This includes univariate analysis, group comparisons, and regression techniques for survival analysis. Parametric and semi-parametric regression techniques covered will include those with categorical and/or continuous explanatory variables, both with and without interaction effects. Prerequisite: HDSC - 820, 835, 840, and 871, or by permission of instructor.

### *HDSC 855 Statistical Methods in Genomics Research (3)*

This survey course will provide a high-level introduction to various statistical and bioinformatics methods involved in the study of biological systems. In particular, this course will provide an overview of the analytical aspects involved in: the study DNA, RNA, and DNA methylation data measured from both microarray and next-generation sequencing (NGS) technologies. During the last week of the summer semester, students will be required to participate in a group seminar session in which they will present the results from their assigned genomics projects. Prerequisite: HDSC 820 OR experience programming in a higher level programming language; HDSC 840; OR by permission of the instructor.

### *HDSC 861 Observational Health Data Analytics*

This course provides an understanding of the design and analysis of observational studies in health settings. This includes an introduction to common observational designs (e.g., cohort, case-control, and cross-sectional designs), sources of bias in observational analyses, and considerations for data

quality and security in health data analysis. Analytic strategies for observational data are covered, including identifying and addressing bias, handling missing data, and applying multivariate regression techniques for linear and categorical data.

Prerequisites: By permission of instructor; HDSC 835 Categorical Data Analysis, HDSC 840 Linear Regression, and either HDSC 823 Introduction to Programming and Applied Statistics in R or HDSC 820 SAS Programming I.

### *HDSC 871 Mathematical Statistics I (3)*

This course introduces the fundamentals of probability theory, random variables, distribution and density functions, expectations, and transformations of random variables, moment generating functions, convergence concepts, sampling distributions, and order statistics. Prerequisite: By permission of instructor.

### *HDSC 872 Mathematical Statistics II (3)*

This course introduces the fundamentals of statistical estimation and hypothesis testing, including point and interval estimation, likelihood and sufficiency principles, properties of estimators, loss functions, Bayesian analysis, and asymptotic convergence. Prerequisite: HDSC 871 or by permission of instructor.

### *HDSC 880 Data Mining and Analytics (3)*

Students will be introduced to common steps used in data mining, such as accessing and assaying prepared data; pattern discovery; predictive modeling using decision trees, regression, and neural networks; and model assessment methods. Prerequisite: Corequisite: HDSC 823, 835, and 840, or by permission of instructor.

### *HDSC 881 Statistical Learning I (3)*

Statistical learning is a fundamental skill for data scientists. Data scientists are specialists in "drinking from the firehose" of big data, and statistical learning techniques are some of their key tools. This course focuses on applications of statistical learning to big data challenges through data mining and predictive modeling techniques that are in great demand. Students will be introduced to the basics of statistical/machine learning: supervised learning (e.g. linear model, nonlinear models, penalized methods, ensemble methods, etc.), unsupervised learning (e.g. K means clustering, nearest neighbors, hierarchical clustering, etc.), and missing data in machine learning. Throughout the course, we will learn how to be "informed doers", who not only know how to apply methods but understand how those methods work. This understanding can be critical to getting good results from big data, so that the limitations of certain methods are properly understood. Prerequisite: HDSC 823, HDSC 835, HDSC 840, or by permission of instructor.

### *HDSC 882 Statistical Learning II (3)*

Knowledge of how and when to apply more sophisticated statistical learning models to big data can make a data scientist an indispensable asset to a research team. In Statistical Learning 2, we will learn how to be "informed doers". We will learn how many of the covered methods work, in addition to the proper situations to apply them. This is particularly important in this course, because these methods are applicable when simpler methods are inappropriate and rarely work well without significant tinkering. Data scientists with mastery of these methods are empowered to investigate questions that are far too complex to answer with the more general "workhorse" methods covered in the first unit of this series, Statistical Learning 1. We will cover many of the most important techniques in use today, including: mixture models, hidden Markov models, spline regression, support vector machines, advanced discriminant analysis methods, neural networks (including deep learning), and methods for handling highly complex computation, such as Hadoop. The course culminates with a short

project that will pull together all the skills you have learned to demonstrate how they can be used for statistical decision support, which is a common task for data scientists. Prerequisite: HDSC 881, or by permission of instructor.

*HDSC 883 Processing and Analysis of Medical Information Systems (3)*

Medical information systems (MIS) are essential tools of modern medicine. Healthcare data scientists must construct MIS and process the information contained in MIS. This course provides an overview of current MIS, such as electronic health record systems, clinical decision support systems, and medical imaging systems. The course will focus on theories and methodologies that support MIS construction and information processing as well as analysis, including artificial intelligence, machine learning and deep learning, knowledge representation and uncertainty reasoning, natural language processing, statistics, and medical imaging. At the end of this course, students will understand how these methodologies work and how to use these methodologies to construct MIS, process information and analyze data. Prerequisite: HDSC 881, 819 or by permission of instructor.



## Educational Opportunities

### Journal Club

The Department of Biostatistics & Data Science hosts a Journal Club meeting on the first Friday of the month from 12:00 pm – 1:00 pm. All students will be included in the invitation email. Locations change monthly, so please check email invitation.

For additional information regarding Journal Club meetings, please contact Madison Johnson at (913) 574-3278 or [mjohnson89@kumc.edu](mailto:mjohnson89@kumc.edu).

### Seminar Series

The Department of Biostatistics & Data Science Faculty host seminars every third Friday of the month from 11:00am – 12:00pm held virtually and in-person for the 2023-2024 academic calendar year. All students will be included in the invitations emails and regular attendance is required.

For additional information regarding the Seminars, please contact Paige Rice at [price3@kumc.edu](mailto:price3@kumc.edu).

### Graduate Professional Development Seminar

The Graduate Professional Development Seminar is a career prep and development seminar series targeting our graduate students. The goal is to help introduce our students to industry, government, and academic statisticians to help them better decide how to identify and prepare for jobs. The seminar is currently held once a month, for one hour.

For additional information regarding this seminar, please contact Mandy Rametta at [mrametta@kumc.edu](mailto:mrametta@kumc.edu).

### FACTS Working Group

To foster collaboration and methodological development in novel trial designs, the BISR instituted the Fixed and Adaptive Clinical Trial Simulator Working Group in 2018. This groups meets biweekly and is comprised of faculty, staff, and trainees with an interest in the application and development of methods/tools for novel clinical trial design and execution. For additional information regarding FACTS, please contact either Elena Shergina at (913) 588-2774 or [e696s865@kumc.edu](mailto:e696s865@kumc.edu) or Byron Gajewski at (913) 588-1603 or [bgajewski@kumc.edu](mailto:bgajewski@kumc.edu).

## Statistical 'Omics Working Group (SWOG)

The Statistical 'Omics Working Group (SWOG) is comprised of faculty, staff, post-docs, and students with a general interest in the development and application of statistical/bioinformatics methods to 'omics data types (e.g., genomics, transcriptomics, epigenomics, etc.). The purpose of SWOG is multifold: it provides an encouraging and safe environment to share and exchange ideas about novel statistical/bioinformatics methods and novel applications of existing methods, learn about upcoming conferences and other events of interest, receive feedback on one's collaborative/dissertation research from peers and colleagues, and receive advice on manuscript writing, peer-reviewing, and oral communication skills. The SWOG meets weekly on Fridays from 9:30am-11:00am and is comprised of 12-18 active members.

## Health Data Mapping Working Group

The Health Data Mapping (HDM) working group was established in December 2022 to promote collaboration and methodical application in developing health-related data using spatial, spatial-temporal, and time series methodologies. Comprised of dedicated faculty, staff, and graduate students, this group comes together bi-weekly, united by a shared interest in advancing methods and tools for health data mapping. Since its formation, the group has achieved remarkable progress, completing numerous projects, including manuscripts and abstracts, and providing opportunities for students to attend conferences. The Health Data Mapping Group continues to serve as an essential platform for fostering innovation and excellence in health data analysis, contributing to the broader understanding and improvement of public health initiatives. For more information regarding HDM, please get in touch with either Dinesh Pal Mudaranthakam ([dmudaranthakam@kumc.edu](mailto:dmudaranthakam@kumc.edu)), Isuru Ratnayake ([rratnayake@kumc.edu](mailto:rratnayake@kumc.edu)), or Sam Pepper ([spepper@kumc.edu](mailto:spepper@kumc.edu)).

## ASCEND

Modeled after the NIH BEST model of training, ASCEND (Achieving Successful Careers, Exploring New Directions) provides graduate students and postdoctoral trainees the opportunity to explore diverse career options and build the skills to successfully launch the next phase of their careers. Visit the [ASCEND](#) website to learn more about the program, access an archive of ASCEND workshops, and find upcoming events.



# Biostatistics & Data Science Student Computing Lab

The Biostatistics & Data Science Department offers student a computing lab on Fridays from 10:00 AM-12:00 PM and 1:00 PM-3:00 PM during academic semesters, located in Robinson G022 and through online appointment. In the lab there are computer terminals that students are allowed to utilize for their studies. The computers have programs installed on them such as SAS, R, as well as others needed for course work. Students are allowed to use the services of this lab as long as they respect the rules of the lab. Rules of the lab include:

- No food or drink near the computers
- Always sign in and out on the Computing Lab Log
- Always turn off the computers when you are finished working.

For more information regarding the tutoring lab, please contact Madison Johnson ([mjohnson89@kumc.edu](mailto:mjohnson89@kumc.edu)).

## Student Resources

Office	Contact Information
Registrar's Office	Phone: 913-588-7055 Email: <a href="mailto:kumcregistrar@kumc.edu">kumcregistrar@kumc.edu</a> Website: <a href="http://Registrar's Office (kumc.edu)">Registrar's Office (kumc.edu)</a>
Office of Graduate Studies	Office: 1005 Dykes Library Phone: 913-588-1238 Email: <a href="mailto:GradStudiesOffice@kumc.edu">GradStudiesOffice@kumc.edu</a> Website: <a href="http://Graduate Studies (kumc.edu)">Graduate Studies (kumc.edu)</a>
Student Health Services	Office: Student Center, 1012 Make an Appointment: 913-588-1941 Email: <a href="mailto:studenthealthrecords@kumc.edu">studenthealthrecords@kumc.edu</a> Website: <a href="http://Student Health Services (kumc.edu)">Student Health Services (kumc.edu)</a>
Student Financial Accounting	Office: 120-B Support Services Facility 2100 West 36th Ave. MS 4008 Kansas City, KS 66160 Phone: 913-588-2590 Email: <a href="mailto:studentaccounting@kumc.edu">studentaccounting@kumc.edu</a> Website: <a href="http://Student Financial Accounting (kumc.edu)">Student Financial Accounting (kumc.edu)</a>
Student Financial Aid	Office: G035 Dykes Library Phone: 913-588-5170 Email: <a href="mailto:FinancialAid@kumc.edu">FinancialAid@kumc.edu</a> Website: <a href="http://Student Financial Aid (kumc.edu)">Student Financial Aid (kumc.edu)</a>
Office of International Programs	Office: 1017, 1018 & 1019 Dykes, Academic Affairs Email: <a href="mailto:InternationalProgs@kumc.edu">InternationalProgs@kumc.edu</a> Website: <a href="http://Office of International Programs (kumc.edu)">Office of International Programs (kumc.edu)</a>

## Course Catalog

You can find the full list of all courses within the department at:  
<https://catalog.ku.edu/medicine/biostatistics/#courseinventory>.

## Policies and Procedures

All policies and procedures that govern graduate students at KUMC can be found at:  
<https://www.kumc.edu/academic-and-student-affairs/departments/graduate-studies/policies-and-regulations.html>

## Student Compliance Training

**All KUMC students are required to complete annual compliance training during the June 1 through September 30 student training window.** Failure to complete the training will result in a hold being placed on your student account that will prevent future enrollment until the training is completed.

The training is completed on-line at [KUMC Saba Training](#). Once you have logged into myKUMC , the following modules will be populated that are required for students:

- **Computer Security Training**
- **Harassment Tutorial (full or refresher student version)**
- **HIPPA Training (student or employee version)**
- **University/UKP Safety Training (student version)**
- ***Special for 2020: COVID Returning to Campus Safely***

**Once you have logged in and completed your training, please send an email to the Senior Academic Program Specialist, Mandy Rametta at [mrametta@kumc.edu](mailto:mrametta@kumc.edu) verifying that you have completed the training and the date that you have done so.** This is a mandatory requirement for the Biostatistics & Data Science Department at KUMC. **Students who fail to complete training by the specified deadline will lose access to all KUMC resources (e.g., email, Blackboard, myKUMC).**

## Enroll and Pay

Enroll and Pay is the student information system used at KUMC for:

- Admissions
- Enrollment
- Bills and Payments
- Financial Aid
- Curriculum Management
- Class Rosters
- Grading
- Academic Records
- Emergency contacts

Students may log on to Enroll and Pay at: <https://sa.ku.edu> using their KUMC Network/GroupWise username and password.

Please go to <http://sis.ku.edu> for student tutorials on how to sign-in and navigate the system, how to enroll, how to view course schedules and course grades, online payments, navigating financial aid, and how to update personal and contact information. All BIOS courses require permission to enroll. Students should work with their academic advisors to receive permission codes.

## KUMC Blackboard

Blackboard is a course management tool that allows instructors to create web-based courses. Students must have a valid KUMC username and password to access the courses created in Blackboard.

### To login to Blackboard

1. Go to <https://bb.kumc.edu/>
2. Students will login with their KUMC Outlook username and password. Faculty and staff will login with their network username and password. You will have one Blackboard account for all Blackboard courses while at KUMC. If you have difficulty logging in, contact the Help Desk at 913-588-7107.
3. Once in Blackboard you will see a list of all the courses that you are enrolled in. Note: courses will appear about a week before the semester begins.
4. Click on the course title (under Courses) to go to a course home page.

**Blackboard Resources for Students:** <https://www.kumc.edu/information-technology/services/teaching-and-learning-technologies/blackboard-at-kumc/student-resources.html>

## Student Services

The KUMC Office of Academics and Student Affairs contributes to the academic mission of the university with quality student-centered programming and services that support the emotional, intellectual, personal and professional growth of our individual students. The primary goal of the division is to provide essential support services that assist students as they pursue their academic goals, and coordinate student services so as to insure that they are efficient, accessible and "user-friendly."

For more information on the Student Service Departments, please refer to:

<https://www.kumc.edu/academic-and-student-affairs.html>

### Student Service Departments include:

- Career Services
- Counseling & Education Support Services
- Kirmayer Fitness Center
- Enrollment Services
- Student Financial Aid
- Office of Student Life
- Student Health Insurance
- Student Health Services
- Academic Accommodations

## Graduate Student Professional Development Award

### Professional Development Award

Professional Development Awards are given four times a year through a competitive application process. Graduate students who are accepted to present at a regional or national scientific meeting are eligible to apply. These awards may be a maximum of \$550. Deadline: The first working day of the following months: January, April, July and October.

Completed applications should be submitted to the Office of Graduate Studies, 5015 Wescoe, Mail Stop 1040. Questions, contact the Office of Graduate Studies at (913) 588-1238 or by email at [gradstudiesoffice@kumc.edu](mailto:gradstudiesoffice@kumc.edu).

### SGC Travel Awards

Graduate students may apply for travel awards for professional development made available through the KUMC Student Governing Council (SGC). Application for this award is managed by SGC, all questions regarding this award should be directed to Ryan Gove at [rgove@kumc.edu](mailto:rgove@kumc.edu).

## Equal Opportunity and Nondiscrimination

The Biostatistics & Data Science program and the University of Kansas Medical Center are committed to ensuring equal opportunity. Detailed information about equal opportunity and non-discrimination policies are outline on the Institutional Opportunity & Access website at: <http://ioa.ku.edu/>. Students are asked to complete a Request for Service Form at the beginning of the Health Data Science MS program. If any student identifies the need for services they are asked to contact:

- Equal Opportunity/ Disability Services in 1040 Wescoe, 913.588.1206 (voice ) / 913.588.7963 (TDD), or
- Student Counseling and Educational Support Services in G116 Student Center, 913-588-6580.

The University of Kansas Medical Center is committed to ensuring equal opportunity. Its [equal opportunity/nondiscrimination policy](#) is designed to ensure that employees, students, residents, faculty and supervisors understand their rights and responsibilities. The University's [discrimination complaint procedure](#) is designed to ensure that concerns are handled in a timely and responsive manner. For inquiries regarding the University's EO/nondiscrimination policies, contact the [EEO Office](#), 1054 Wescoe, 913-588-1206 (V) or 913-588-7963 (TDD).

## Dropping an Individual Course / Canceling or Withdrawing From all of Your Classes

You can drop individual classes online via Enroll and Pay through the withdrawal deadline. Login to Enroll and Pay, navigate to the Student Center, select Drop a Class, and follow the instructions. **Students should consult with their academic advisors, Program Director, Graduate Studies, and Financial Aid prior to dropping or withdrawing from a class.**

- Dropping all of your classes before the first day of classes is considered a **Cancellation**.
- If you want to cancel a future semester, this is considered a **Cancellation from Future Semester** and must be done before the first day of classes.
- Dropping all of your classes after the semester has started is considered a **Withdrawal**.

For important dates and further instructions, see the following website: <http://www.kumc.edu/student-services/enrollment-services/current-students/dropping-and-withdrawing-from-classes.html>.

## Student Reporting Resources

A comprehensive list of reporting resources for students is available at:  
<https://www.kumc.edu/academic-and-student-affairs/about/reporting-resources/student-resources.html>

### The Office of Graduate Studies Website:

<http://catalog.ku.edu/graduate-studies/kumc/>

### The KUMC Registrar's Website:

<http://www.kumc.edu/school-of-medicine/osa/policies-procedures-and-manuals/leave-of-absence.html>

## KUMC Office of International Programs

In an interdependent world, International Programs believes that it is essential for faculty, students, and staff to have the opportunity to become personally and intellectually familiar with the people, ideas, and customs of other nations. Such interaction not only promotes a universal perspective and intellectual growth, but also contributes to the cultural and economic well-being of the university, the state, and the nation.

### Activities & Programs

The Office of International Programs offers a variety of activities and programs designed to provide informative and meaningful answers for a wide range of international student concerns, as well as provide a medium for open, respectful interaction in an informal and positive setting. Events offered through the Office of International Programs are coordinated by the ESL & Cultural Programs Coordinator. Please check the KUMC [Office of International Programs Event Calendar](#) for upcoming activities and where they will be held.

[KU International Affairs Events Calendar](#) also offers information that may interest international students on the Kansas City campus. Please note that non-activity related guidelines and programs listed on this site are specific to KU Lawrence and may not apply to international students on the Kansas City campus.

For more information about the International Programs Office, please visit:  
<https://www.kumc.edu/academic-and-student-affairs/departments/office-of-international-programs.html>.

# Academic Honor Code

BIOS / STAT/ DATA/ HDSC Courses

Honor Code Policy

The Department of Biostatistics & Data Science expects all students of the University of Kansas taking courses to act in **academic matters** with the utmost honesty and integrity. A student violates the Honor Code if the student engages in **dishonorable conduct** in connection with an academic matter.

**Academic matter** means an activity that may affect a grade or in any way contribute toward the satisfaction of the requirements for the course without reference to the focus of such activity. Academic matters include, but are not limited to, the following activities:

1. An examination.
2. A homework assignment or other activity to be done outside the class.
3. Postings on the discussion board.
4. Work that is in whole or partial satisfaction of requirements for course credit.
5. An activity for which course credit is given.

**Dishonorable conduct** means an act of academic dishonesty. The term dishonorable conduct includes, but is not limited to, the following acts:

1. Offering for course credit as one's own work, in whole or in part, the work of another.
2. Plagiarism; that is, incorporating into one's work offered for course credit passages taken either word for word or in substance from a work of another, unless the student credits the original author and identifies the original author's work with quotation marks, footnotes, or another appropriate written explanation.
3. Offering for course credit one's own work, but work that one has previously offered for course credit in another course, unless one secures instructor permission to do so.
4. Offering for course credit work prepared in collaboration with another, unless the student secures the instructor's permission in advance of submission.
5. Using, during an examination period, material not authorized by the instructor.
6. Giving, receiving, or obtaining information pertaining to an examination during an examination period, unless such action is authorized by the instructor.
7. Divulging the contents of examination designated by the instructor as an examination not to be removed from the examination room or discussed.
8. Failing to follow the instructions of an instructor in completing an assignment or examination, if one knows or should reasonably know that one would, by such conduct, obtain an unfair academic advantage.
9. Witnessing conduct which one knows or should reasonably know is dishonorable and failing to report it as required by this Honor Code.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Print Name: \_\_\_\_\_



# PROCTOR AGREEMENT FORM

• Department of Biostatistics • 12600 Quivira Rd.  
 • Overland Park, KS 66213 • stats\_education@kumc.edu

Thank you for your willingness to serve as a proctor for a University of Kansas student taking a Biostatistics or Applied Statistics & Analytics course. Please review the attached proctor policy. If you meet the qualifications and are willing to assume the responsibilities, please sign and submit this agreement form to stats\_education@kumc.edu. Should you have questions before, during, or after the examination, please e-mail stats\_education@kumc.edu.

STUDENT INFORMATION					
Last Name	First		Student ID		
Phone	Email				
PROCTOR INFORMATION					
Last Name	First		Middle Initial		
Title				If active military, indicate rank	
Degree Earned	School Name				
Employer					
Business Address					
	City	State	Zip		
Email	Work Phone		( ) -		
Relationship to Student	Duration of Relationship				

PROCTOR QUALIFICATIONS/CERTIFICATION					
<p><b>I am one of the following:</b></p> <input type="checkbox"/> Armed Forces Education Officer or Officer of a higher rank <input type="checkbox"/> University/College Testing Center, Private Testing Center, KUMC Department of Biostatistics Representative <input type="checkbox"/> State-certified High School Superintendent, Principal, Vice Principal, Teacher, or Counselor <input type="checkbox"/> University/College Professor, Dean, or Director <input type="checkbox"/> Full time Public Library Librarian <input type="checkbox"/> Minister, Priest, or Rabbi of an established church, temple, mosque, or synagogue					
<p><b>I am not any of the following:</b></p> <input type="checkbox"/> Assistant, tutor, neighbor, co-worker, relative, friend, University of Kansas student, or anyone with a conflict of interest. <i>The individual selected to serve as proctor must have no vested interest in the exam outcome.</i>					
<p><i>The proctor must provide a business card verifying his/her qualification, Please attach here or submit on a separate piece of paper. A letter from the proctor's employer may be substituted for the business card if one is not available. This request will not be considered without the required support documentation.</i></p>					

I hereby certify I meet the requirements of a University of Kansas proctor. As an authorized exam proctor, I agree to adhere to those responsibilities and procedures outlined in the Proctor Policy when administering Exams. Most importantly, by my signature below I attest that I will only allow the student to access his/her exam in my presence and that I will remain in proximity during the taking of this exam. I will close student access to the exam at the end of the allotted time period. I also agree that the University of Kansas may contact me for verification purposes and I grant permission for the University of Kansas to verify my credentials.

Proctor Signature \_\_\_\_\_  
 Date \_\_\_\_\_



## Examination Proctor Policy

University of Kansas Biostatistics and Applied Statistics & Analytics degree programs contain a variety of assignment types and methodologies. Comprehensive sets of questions or exercises are used to evaluate knowledge, skills, and mastery of subject matter prior to and during the final examination. Numerous courses within a program of study may require midterm and/or final examination; for which, an approved proctor is required. An approved proctor is defined as a credentialed organization, center, or individual, who verifies student identity and supervises examination integrity.

The Department of Biostatistics must approve student selected proctors. If the student does not complete the final exam within the limits of the term or an approved extension, the grade for the exam will be an F.

The following are important facts concerning proctored examinations:

- It is the student's responsibility to ensure a proctor is approved by the Department of Biostatistics before the exam.
- Refer to course examination instructions for materials allowed during the exam. Materials not specified in the examination instructions are not permitted. Students may use a computer to access an online examination and/or type answers. They may not use the internet to search for answers to the exam questions. Refer to course examination instructions as to whether students are allowed to use their course materials and textbook(s). Other materials are not permitted unless specified in the examination guidelines or course syllabus.

### GENERAL INFORMATION

- Valid, government-issued photo identification, such as a driver's license, is required for identity verification prior to examination administration to receive credit for the examination.
- Compliance with all identified examination violations is required, as noted in the Exam Violations section of this policy.
- Students are allowed short breaks during the examination. A total of 15 minutes break time is permitted during every four (4) hours of examination time. No materials are allowed to leave or re-enter the testing area.
- Refer to course examination instructions for the allotted time period for examination completion, which begins at the time the examination is initially opened. The time allotment is cumulative; therefore, short breaks taken during the examination administration are included in the time allotment.
- Fees incurred by use of proctoring services are the responsibility of the student.
- Examinations should not be taken in an environment where the student is likely to be interrupted during examination administration; i.e. the workplace or other interactive environment.

### Proctor Policy

Exams are to be administered to students by an approved proctor on a date that is mutually convenient and approved by the course instructor. The student is responsible for selecting a qualified proctor who must be approved by the department. A list of acceptable proctors is provided in the Proctors section of this policy. Proctors must submit a signed Proctor Agreement for approval before being allowed to proctor an exam. Proctors are to verify the student's identity, remain in proximity while the student takes the exam, assure that the allotted exam time limit is strictly adhered to, assure that the student adheres to the policy regarding short breaks or breaks totaling no more than 15 minutes during each 4 hour period, and assure that no unauthorized materials are allowed during the exam. Students should allow time for the potential proctor to return the "Proctor Agreement" to the Department of Biostatistics and for processing before the scheduled exam date/time.

### Proctors

The University of Kansas Department of Biostatistics reserves the right to verify proctor qualifications, require additional evidence of eligibility, or require a different proctor be selected.

### Qualified Proctor:

- University/College Professor, Dean, Director, or university official
- State-certified High School Superintendent, Principal, Vice-Principal, teacher or counselor
- University/College Testing Center
- Private Testing Center
- Commissioned Officer or Senior Non-Commissioned Officer in the Armed Forces or Civil Service equivalent
- Police or fire service sergeant or higher
- Military Base Testing Offices
- Library / Librarian
- Minister, Priest, Rabbi or other Religious Leader

#### Unqualified Proctor:

- Any individual that poses a conflict of interest
- Co-worker
- Tutor
- Friend
- Neighbor
- Relative
- University of Kansas Student
- Individuals paid for a personal service (doctor, attorney, consultant, etc.)
- Individuals deemed unqualified by the University of Kansas personnel

#### Possible forms of certification

- Business Card
- Work badge with position (excluding military identification card)
- Teacher's ID or copy of Teaching Certificate
- Official military documentation stating the name and grade of the potential proctor (LES, ORB, etc – personal information may be blacked out)

Individuals selected to serve as a proctor must have no vested interest in the outcome of the exam. Falsifying proctor information or not following proctor testing procedures will result in failure of the course and may be cause for termination from the University of Kansas.

#### Proctor Responsibilities

- Keep the exam secure and only allow the student to access the exam in the proctor's presence. The password must be kept confidential and should never be shared with the student.
- Provide the student with a private area conducive to testing. A computer with Internet access must be available.
- Check student's photo ID to ensure the examinee is actually the person scheduled to test.
- Ensure no copies of the exam are made.
- Ensure that the student does not access notes, articles, or other unauthorized materials. Unless otherwise specified, only the textbook and course materials are allowed.
- Time the exam and stop the examinee when time has been expended.
- Ensure that the student does not exceed 15 minutes of cumulative break time during every 4 hours of the exam.
- Keep the exam during any breaks. The student should never have access to the test without the proctor present and the test should never leave the testing room.
- If a fee is charged for exam proctoring, request payment from the student at the time of testing. Students are responsible for any proctor fees.

#### Standard Proctoring/Testing Procedures:

- The Department of Biostatistics will notify both the student and proctor of approval/denial, via email within 2-3 business days of submission of the Proctor Agreement Form.
- The student and proctor will meet at a pre-determined, mutually convenient, and instructor approved time and location for examination administration.
- The proctor must verify student identity by viewing a valid, government issued photo identification and ensure only permitted materials are used during the examination.
- Completed examinations, and all test materials (cheat sheets, scrap paper, etc.), should be sent to the course instructor within 2-3 business days of administration.

# Technical Standards

## Technical Standards and Requirements MS in Health Data Science Department of Biostatistics & Data Science

Because the MS in Health Data Science degree signifies 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 MS program:

- 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.

**Please carefully read the above and check one of the following statements.**

\_\_\_\_\_ I have carefully reviewed and can meet the technical standards of the MS Program without accommodation.

\_\_\_\_\_ I have carefully reviewed and can meet the technical standards of the MS Program with accommodation.

The University of Kansas provides equal opportunity in education and employment. Students requiring academic accommodations should contact Academic Accommodations Services at <http://www.kumc.edu/student-services/academic-accommodation-services.html>.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name

# Shared Drive Usage Policy

## Department of Biostatistics & Data Science Shared Drive Usage Policy

When working with your mentor on your GRA assignment,

Things that can help a student efficiently complete their project's/tasks:

- Always store all the information and project related documents under the shared drive (S drive or P drive).
- During your first meeting with your mentor make sure a folder has been created and access is provisioned appropriately. For questions related to access, one could contact the Director of Research Information Technology at [dmudranthakam@kumc.edu](mailto:dmudranthakam@kumc.edu)
- For any reason, if you are working on data set and hasn't been assigned with a Department of Biostatistics & Data Science computer please check with either your mentor or Director of Research Information Technology.
- If you have any question or unsure as to how to handle the data or storage related issue please check with your mentor and/or Director of Research Information Technology at [dmudranthakam@kumc.edu](mailto:dmudranthakam@kumc.edu) .

you should **never**:

- Store documents containing sensitive information on laptop or notebook computers unless the computer is certified, and the information is encrypted. Call Information Security at ext. 8-3333 for information about personal computer certification and encrypting data.
- Store documents containing sensitive information on mobile devices such as iPhones or Personal Data Assistants (PDAs, Palms, PocketPCs, Windows CE devices, BlackBerries) unless such storage is approved by your department and the PDA is password-protected.
- Store sensitive information on small portable storage devices such as floppy drives, zip disks, flash memory drives (keychain drives, flash drives, USB memory keys), CDs, or DVDs unless the information is encrypted, and the device has been approved by Information Security.
- Store sensitive University information on a home computer or any other computer not owned by the University.

- Provide an outside entity with any type of sensitive information without the informed consent of your department chair. Be aggressive in seeking clarification and confirmation that including sensitive information is essential. While this may seem obvious in the case of (for example) patient information, it applies equally to a spreadsheet containing employee names and dates of birth or SSNs.
- Send any form of sensitive information off-campus via email using Outlook or any other email system except KUMC's Secure Email System. For information on the Secure Email System, please visit the [secure email website](#).
- Post any form of sensitive information on a web server.
- Transmit files containing sensitive information outside of the KUMC network in a manner that does not utilize encryption to protect the communication (e.g., the SecureFiles system, SSL, VPN, etc).
- Store sensitive information in third-party online application services, unless a University contract with that vendor is in place which protects sensitive information.
- Store documents containing sensitive information on third-party online storage services, unless a University contract with that vendor is in place which protects sensitive information.

**By providing my signature below, I confirm that I have read and agree to this document, and to not storing any type of data on personal devices.**

Signature of Student

Date

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Print Name of Student

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