

# Syllabus for STAT 240 – Biometrics I

## STAT 240 – Biometrics I

This course will make use of both Canvas and an external course website built through GitHub Pages (<https://pages.github.com>). The course can be completed without using the GitHub Pages, however using it is *highly* recommended.

**Credit Hours:** 3

**Lecture:** In-Person

**Class Meeting Days and Time:** M/W/F 11:30 AM – 12:20 PM CST

**Class Meeting Location:** Dickens 207

### Instructor Information

Name: Robert Sholl

Email: [rmsholl@ksu.edu](mailto:rmsholl@ksu.edu)

Department: Statistics

Office: Dickens 009C

Office Hours: M/W 10:20 AM - 11:20 AM CST or by-appointment

### Communication

During business hours I will response to emails or Canvas messages within 2 business days at most, this includes messages sent outside of business hours. Response times will vary throughout the semester. If I have not responded within 2 business days feel free to contact me again or approach me directly after class/during office hours.

Full class communications will occur via Canvas and in-class announcements.

**Note:** If you have course specific questions that are not addressed in this document, I am happy to help. However, for technical (computer related) questions, it is best to call the IT Service Desk at 785-532-7722.

### Course Overview

**This course is an introduction to the field of statistics as it applies to the biological sciences. We will cover a range of topics from simple summary statistics and formulating samples to simple statistical models and methods of inference.**

### Course Learning Objectives

By the end of this course, students will have a basic grasp of:

- Graphical tools for data analysis
- Sampling methods for observational studies
- The design of experiments
- Probability and distribution theory
- Simple linear regression
- Uncertainty quantification
- t-tests for statistical hypotheses

# Syllabus for STAT 240 – Biometrics I

## **Prerequisites**

There are no mandatory prerequisites but the completion of high school algebra is strongly encouraged.

## **Required Materials**

A calculator is required. Cell phone calculators are not allowed in the exams.

The textbook for this class is provided for free.

## Expectations

### **What you can expect of your instructor**

Assignments and exams will be graded within a week of completion. Per university requirements all coursework that students have completed, signed their name on, and received a grade for are the property of the student. If you would like the physical copy of your exam after it has been graded you can email me or speak to me directly.

This course is designed to encourage students to engage with their education without the fear of making mistakes. The pacing of assignments is such that students won't have a strong assessment of their grades until after the first exam. As such I provide multiple opportunities throughout the semester to recover lost points.

If you have a personal concern or question you would like to talk about, please send me an email directly.

### **What I expect of you**

Expect to spend 3 hours a week on this course outside of class time, it's best to pace this as 20-30 minutes of practice or reading daily. Textbook readings should be completed prior to lecture. I expect you to ask questions if something is unclear.

### *Netiquette*

K-State Online rules of style and [Netiquette Standards](#) (network etiquette) are expected when communicating through class e-mail and discussions.

# Syllabus for STAT 240 – Biometrics I

## Schedule

Below is the tentative schedule for this course. Everything is subject to change. All assignments noted in the “Activity” tab are due the Friday of that week.

| Unit/Module/Week | Objective                       | Activity (Due Date)  |
|------------------|---------------------------------|----------------------|
| 1                | Graphics and Summary Statistics |                      |
| 2                | Observation and Correlation     |                      |
| 3                | Experiments and Causation       |                      |
| 4                | Probability Theory              | Unit 1 Problems      |
| 5                | Exam 1                          | Unit 1 Question Bank |
| 6                | Random Variables                |                      |
| 7                | Distribution Theory 1           |                      |
| 8                | Distribution Theory 2           |                      |
| 9                | Regression 1                    |                      |
| 10               | Regression 2                    | Unit 2 Problems      |
| 11               | Exam 2                          | Unit 2 Question Bank |
| 12               | Uncertainty Quantification      |                      |
| 13               | Hypothesis Testing 1            | Final Report         |
| 14               | Hypothesis Testing 2            | Unit 3 Problems      |
| 15               | Statistical Inference           | Unit 3 Question Bank |
| 16               | Final Exam                      |                      |

## Assignments

### Attendance and Participation

Attendance and in-class participation are highly encouraged but not required. All relevant course content will be published on Canvas and the external course website. Lectures will only be recorded or held virtually in the event of extreme circumstances where class cannot be held in person. Extra credit may be given out periodically to students who are present in class.

# Syllabus for STAT 240 – Biometrics I

## Unit Question Banks

Each unit will have a question bank of 50 problems related to the unit. Prior to each unit's exam you will be required to submit their answers to 10 problems of your choosing out of the relevant question bank. You are not required to show your work since **no partial credit will be offered**.

You can turn in worked solutions to any problem from the bank after class or during office hours to receive feedback with no penalty.

You can continue to complete problems beyond the initial 10 for extra credit towards that unit's exam. You **must show your work** for all extra problems. Each additional problem correctly completed is 0.5 points extra out of the 100 each exam is worth.

## Final Report

You will be asked to complete one of the options below:

- a. Attend a scientific talk (on or off campus) then write a paper with the following:
  - i. 2-3 sentences summarizing the talk.
  - ii. 2-3 sentences about how you felt about the talk and the speaker.
  - iii. 1-2 sentences describing anything you learned.
  - iv. 1-2 sentences describing anything you didn't understand or were unsure about.
  - v. 2-3 sentences either (a) describing any statistical methods that were used/mentioned or (b) describing any statistical methods that could be applicable to the topic discussed.
- b. Talk to someone who does research or uses statistics regularly as part of their job. They can be an academic, industry, or government professional. Ask them about their education in statistics, how they use statistics, and how they view statistics in relation to their profession. Summarize the discussion, anything you learned from it, and anything you recognized from this course during the discussion in **4-8 sentences at most**.
- c. Using R programming, complete an analysis of either (a) pre-selected data provided in Canvas or (b) outside data you selected that has been approved by the instructor. The analysis should include:
  - i. All basic summary statistics discussed during the course.
  - ii. **At least** two graphics from class.
  - iii. A linear model or hypothesis test

Provide all your source code, with every line of code commented, and a brief statement about what can be concluded from the analysis.

# Syllabus for STAT 240 – Biometrics I

## Exams

Each unit will conclude with a comprehensive exam. Due to the nature of the course topic every exam is inherently comprehensive to previous units. All exams will be held in-class, you will have the full 50 minutes to complete the exam.

## Grading

The following grading distribution will be used: **A**= 90-100%, **B**=80-89%, **C**=70-79%, **D**=60-69%, **F**=59% and below.

Grades will be assigned via the rubric below:

| Item            | Grade Weight |
|-----------------|--------------|
| Unit 1 Problems | 10%          |
| Unit 2 Problems | 10%          |
| Unit 3 Problems | 10%          |
| Applied Project | 10%          |
| Exam 1          | 20%          |
| Exam 2          | 20%          |
| Exam 3          | 20%          |
| Total           | 100%         |

## *Late or Missing Assignments*

There will be several assignments that are due by 11:59pm CST on the date listed. The purpose of these deadlines is to help you stay on track to complete all materials in a timely manner. If for any reason you are unable or fail to complete the assignment on time, please contact me as soon as possible so that we can make arrangements for the completion of the work.

## Technology

### Technical Difficulties

K-State has technology recommendations including a [Technology Recommendations](#) for success in online learning. If you have issues with your technology, please contact K-State's [IT Service Desk](#) for assistance (they are the technology experts). If you miss a deadline due to technological difficulties, [Submit a Ticket](#), then exceptions may be made on a case-by-case basis. Phone: 785-532-7722 or toll free 1-800-865-6143.

# Syllabus for STAT 240 – Biometrics I

## Other Technology Resources

- [Canvas](#)
- [Office 365 Help and Support](#)
- [Zoom](#)
- [Media Studio](#)
- [K-State Libraries](#)

## University Policies

### 1. [Academic Honesty](#)

Kansas State University has an Honor and Integrity System based on personal integrity to assure that one's work on all assignments, examinations, or other course work is performed honestly and without unauthorized assistance.

### 2. [Students with Disabilities](#)

Students with disabilities who need classroom accommodations (such as administration of course exams with extended time and/or distraction reduced environment or providing an alternate format of text materials), access to technology, or information about emergency building/campus evacuation processes should contact the Student Access Center and/or their instructor.

### 3. [Classroom Conduct](#)

All student activities in the University, including this course, are governed by the Student Judicial [Conduct Code](#) as outlined in the Student Governing Association By Laws, Article V, Section 3, number 2. Students who engage in behavior that disrupts the learning environment may be asked to leave the class.

### 4. [Mutual Respect and Inclusion](#)

At K-State, faculty and staff are committed to creating and maintaining an inclusive and supportive learning environment for students from diverse backgrounds and perspectives. If you feel uncomfortable in this class or experience bias or discrimination, there are resources available to you.

### 5. [Discrimination and Harassment](#)

Instructors also have a duty to report any behavior they become aware of that potentially violates the University's policy prohibiting discrimination, harassment, and sexual harassment.

# Syllabus for STAT 240 – Biometrics I

## Additional Policies

### Artificial Intelligence

This course assumes that all your course work will be done by you. You will not need to use artificial intelligence (AI) tools such as ChatGPT for any of the assignments. In general, for this class, you should not have an AI instrument do the writing of any portion of any assignment, just as you would not have another person do your writing for you. My aim is to keep the focus on your originality and creativity, your learning and reflection. If you do use AI for any part of any assignment, you will need to cite it fully and properly, using MLA's AI citation guidelines. Using an AI tool to generate assignment content without proper attribution would be a violation of the K-State Honor Pledge.

### Copyright

© Copyright 2025 (Robert Matthew Sholl) as to this syllabus and all lectures. During this course students are prohibited from selling notes to or being paid for taking notes by any person or commercial firm without the express written permission of the professor teaching this course. In addition, students in this class are not authorized to provide class notes or other class-related materials to any other person or entity, other than sharing them directly with another student taking the class for purposes of studying, without prior written permission from the professor teaching this course.

### Academic Freedom

Kansas State University is a community of students, faculty, and staff who work together to discover new knowledge, create new ideas, and share the results of their scholarly inquiry with the wider public. Although new ideas or research results may be controversial or challenge established views, the health and growth of any society requires frank intellectual exchange. Academic freedom protects this type of free exchange and is thus essential to any university's mission.

Moreover, academic freedom supports collaborative work in the pursuit of truth and the dissemination of knowledge in an environment of inquiry, respectful debate, and professionalism. Academic freedom is not limited to the classroom or to scientific and scholarly research but extends to the life of the university as well as to larger social and political questions. It is the right and responsibility of the university community to engage with such issues.

### Weapons Policy

Kansas State University prohibits the possession of firearms, explosives, and other weapons on any University campus, with certain limited exceptions, including the lawful concealed carrying of handguns, as provided in [Kansas State University Weapons Policy](#).

You are encouraged to take the online [Weapons Policy Training](#) module to ensure you understand the requirements of the policy, including the requirements related to concealed carrying of handguns on campus. Students possessing a concealed handgun on campus must be 21 years of age or older and otherwise lawfully eligible to carry. All carrying requirements of the policy must be observed in this class, including but not limited to the requirement that a

## Syllabus for STAT 240 – Biometrics I

concealed handgun be completely hidden from view, securely held in a holster that meets the specifications of the policy, carried without a chambered round of ammunition, and that any external safety be in the “on” position.

If an individual carries a concealed handgun in a personal carrier such as a backpack, purse, or handbag, the carrier must remain within the individual’s exclusive and uninterrupted control. This includes wearing the carrier with a strap, carrying or holding the carrier, or setting the carrier next to or within the immediate reach of the individual.

Each individual who lawfully possesses a handgun on campus shall be wholly and solely responsible for carrying, storing and using that handgun in a safe manner and in accordance with the law, Board policy and University policy. All reports of suspected violation of the weapons policy are made to the University Police Department by picking up any Emergency Campus Phone or by calling 785-532-6412.

### Campus Safety

Kansas State University is committed to providing a safe teaching and learning environment for students and faculty members. To enhance your safety in the unlikely case of a campus emergency make sure that you know where and how to quickly exit your classroom and how to follow any emergency directives. Current Campus Emergency Information is available on the [University's Advisory](#) webpage.

### Student Resources

K-State has many resources to help contribute to student success. These resources include accommodations for academics, paying for college, student life, health and safety, and others found at [Your Online Guide to Student Success](#).

### Student Academic Creations

Student academic creations are subject to Kansas State University and Kansas Board of Regents Intellectual Property Policies. For courses in which students will be creating intellectual property, the K-State policy can be found at University Handbook, Appendix R: [Intellectual Property Policy and Institutional Procedures](#) (part I.E.). These policies address ownership and use of student academic creations.

### Mental Health

Your mental health and good relationships are vital to your overall well-being. Symptoms of mental health issues may include excessive sadness or worry, thoughts of death or self-harm, inability to concentrate, lack of motivation, or substance abuse. Although problems can occur anytime for anyone, you should pay extra attention to your mental health if you are feeling academic or financial stress, discrimination, or have experienced a traumatic event, such as loss of a friend or family member, sexual assault or other physical or emotional abuse.

If you are struggling with these issues, do not wait to seek assistance.

- [Kansas State University Counseling Services](#) offers free and confidential services to assist you to meet these challenges.
- [Lafene Health Center](#) has specialized nurse practitioners to assist with mental health.



## Syllabus for STAT 240 – Biometrics I

- [Office of Student Life](#) can direct you to additional resources.
- [K-State Family Center](#) offers individual, couple, and family counseling services on a sliding fee scale.
- [Center for Advocacy, Response, and Education](#) (CARE) provides free and confidential assistance for those in our K-State community who have been victimized by violence.
- K-State Online students have free access to mental health counseling with [TELUS Help Student Support](#) - 24/7 support via chat and phone.
- The [Division of Academic Success and Student Affairs](#) can direct you to additional resources.

### Unexcused Absences

K-State has a University [Excused Absence Policy](#) (Section F62). Class absence(s) will be handled between the instructor and the student unless there are other university offices involved. For university excused absences, instructors shall provide the student the opportunity to make up missed assignments, activities, and/or attendance specific points that contribute to the course grade, unless they decide to excuse those missed assignments from the student's course grade. Please see the policy for a complete list of university excused absences and how to obtain one. Students are encouraged to contact their instructor regarding their absences.