

MATH 113 – Introduction to Applied Statistics

Spring 2023 Course Syllabus

James Jones, Professor of Mathematics

Mathematics, Science, and Business Division – Richland Community College

Course Meeting Information

The Spring 2023 semester begins January 17 and ends May 15.

Section 01 meets in W249 from 9:00 to 10:10 am on Monday, Wednesday, and Friday.

The final exam will be taken online using the Canvas learning management system. It can be completed anytime between 12:00 am on May 10 and 11:59 pm on May 12.

Here are some important dates.

- January 27 is the last day to withdraw and get a refund.
- May 9 is the last day to withdraw from the course without receiving a letter grade.
- No late work will be accepted after May 12.

This is a face-to-face course that uses the Canvas learning management system. There is an online student orientation to Canvas and the College that must be completed prior to obtaining access to your courses in Canvas.

Submitting assignments in Canvas does not count as attending class. Assignments will be due throughout the week and, per federal guidelines, you should expect to dedicate a minimum of 12 hours per week to this course.

Instructor Information

James Jones, Professor of Mathematics

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Phone: 217-875-7211, ext 6490

Office: S224

Canvas: <https://richland.instructure.com>

The best way to contact the instructor is through Canvas or by email. Do not leave a voice mail as it will not reach the instructor in time to help.

Office Hours

I spend most of my office hours in the classroom before and after class. This allows me to help students with their assignments, homework, projects, exams, and questions. Students are encouraged to come to class early each day and use that time to ask questions of the instructor, work on projects, or just socialize with other students in the course.

These office hours are on Monday, Wednesday, and Friday in room W249.

8:45–9:00 am, 10:10–10:30 am, 12:20–12:30 pm, 1:40–2:00 pm, 3:10–3:45pm

Text

Introductory Statistics with Randomization and Simulation, 1st edition. David M. Diez, Christopher D Barr., and Mine Çetinkaya-Rundel. OpenIntro. ISBN 978-1-50057-669-1 (required)

Download a free PDF version of the textbook from <https://www.openintro.org>. If you would like a printed (non-color) version of the textbook, you can rent it for a few dollars from the College Bookstore or buy it new on [Amazon for \\$10](#).

The choice of using a printed textbook vs an electronic one is completely up to the student. Use whichever one works better for you.

Student Audience

Transfer students in all disciplines. This is a general education course that meets the mathematics requirements for graduation, it does not lead to another course in statistics.

Prerequisite

The prerequisite for Math 113, Introduction to Applied Statistics, is eligibility for ENGL 101 and one of the following: 1) MATH 098 with a C or better grade and MATH 095 with a C or better grade or one year of high school geometry, (2) satisfactory score on the mathematics placement exam, (3) a score of 22 or higher on the math ACT within three years of enrollment, and (4) a score of 560 on the math SAT within three years of enrollment.

Course Description

MATH 113 - Introduction to Applied Statistics

Hours: 4 lecture - 0 lab - 4 credit

Math 113 is a general education statistics course that uses current technology to allow focusing on mathematical understanding instead of routine calculations. Descriptive statistics covered include frequency tables, graphs, and measures of location and variation. Topics from probability include probability rules, counting techniques, and probability distributions. Inferential statistics coverage includes estimation, confidence intervals, hypothesis testing, and probability values. Statistical methods covered include the one and two sample t-tests, one and two proportion tests, chi-square goodness of fit and test for independence, correlation, regression, and analysis of variance. This course makes heavy use of technology to solve real-world applications.

Applicable toward graduation where program structure permits.

- Certificate or degree: All certificates, A.A.S., A.L.S., A.A, A.S.
- Group requirement: Mathematics
- Area of Concentration: Not applicable.

Illinois Articulation Initiative (IAI)

The Illinois Articulation Initiative is a statewide transfer agreement. Their website is at <http://www.itransfer.org>.

Math 113, Introduction to Applied Statistics, satisfies the Illinois Articulation Initiative Definition of a General Education Mathematics Course. It corresponds to M1902, General Education Statistics.

The IAI course description was updated for the Fall 2018 semester and the new description closely matches the Richland course, which had already implemented many of the recommendations.

M1902: General Education Statistics (3-4 semester credits)

This course focuses on statistical reasoning and the solving of problems using real-world data rather than on computational skills. The use of technology-based computations (more advanced than a basic scientific calculator, such as graphing calculators with a statistical package, spreadsheets, or statistical computing software) is required with an emphasis on interpretation and evaluation of statistical results. Topics must include data collection processes (observational studies, experimental design, sampling techniques, bias), descriptive methods using quantitative and qualitative data, bivariate data, correlation, and least-squares regression, basic probability theory, probability distributions (normal distributions and normal curve, binomial distribution), confidence intervals and hypothesis tests using p-values.

Prerequisite: A student in this course should be college-ready in mathematics as assessed by local institutions (for example: Intermediate Algebra with a C or better, placement, co-requisite course, multiple measures, transitional mathematics competencies, PMGE, or professional organization recommendations, etc.). Policies on the acceptance of AP credit vary among academic programs and from institution to institution, so AP credit toward the GECC or major requirements is not guaranteed. A score of 3 or higher on the AP Statistics exam may be considered as equivalent to successful completion of postsecondary courses approved for IAI GECC M1 902

GAISE College Report

The [Guidelines for Assessment and Instruction in Statistics Education \(GAISE\) College Report](#) was written in 2005 and updated in 2016 and is endorsed by the American Statistical Association (ASA) and the American Mathematical Association of Two-Year Colleges (AMATYC). It presents a guideline of what should be contained in an introductory statistics course.

GAISE Recommendations

There are six recommendations of the GAISE report. This course focuses on achieving these recommendations:

- Teach statistical thinking.
- Focus on conceptual understanding.
- Integrate real data with a context and a purpose.
- Foster active learning.
- Use technology to explore concepts and analyze data.
- Use assessments to improve and evaluate student learning.

GAISE Goals

In addition, there are nine goals listed in the GAISE report that this course seeks to meet.

- Students should become *critical readers* of statistically-based results reported in popular media, recognizing whether reported results reasonably follow from the study and analysis conducted.
- Students should understand the *investigative process* through which statistics works to answer questions.
- Students should be able to produce *graphical displays* and interpret what graphs do and do not reveal.
- Students should recognize and be able to explain the central role of *variability* in statistical tendencies and associations.
- Students should recognize and be able to explain the central role of *randomness* in designing studies and drawing conclusions.
- Students should gain experience with how *mathematical models*, including multivariable models, are used in statistics.
- Students should demonstrate an understanding of, and ability to use, basic ideas of *statistical inference*, both hypothesis tests and interval estimation, in a variety of settings.
- Students should be able to interpret and draw conclusions from standard output from *statistics software*.
- Students should display an awareness of *ethical issues* associated with sound statistical practice.

Course Objectives

In addition to the goals and objects defined in the GAISE report, upon successful completion of this course, a student should be able to:

- Create and interpret graphical representations of data.^{1,3,4}
- Use technology when appropriate and know the limitations of technology.³

- Work collaboratively with others towards the completion of a common goal.^{1,2,3,4}
- Use deductive reasoning and critical thinking to solve problems.⁴
- Apply common sense to mathematical problems.⁴
- Determine whether a statement can be proved or must be assumed.³
- Plan an experiment, gather and analyze the data, and interpret the results.^{1,2,3,4}
- Explain the statistical results using common language.^{1,2}
- Read a scenario and determine the proper statistical method for analyzing the data.
- Effectively communicate the student's understanding of the subject.^{1,2}

The numbered superscripts refer to the Richland Cross-Disciplinary Outcomes addressed by that objective.

Richland Cross-Disciplinary Outcomes

Richland Community College has established some outcomes for degree-seeking students. These are not necessarily completed within a single course, but should be demonstrated and assessed at some point before the student graduates. Richland may utilize anonymous student work samples for outcomes assessment and continuous improvement of courses and programs.

Richland Community College's cross-disciplinary outcomes are:

1. The degree-seeking student will communicate effectively in writing.
2. The degree-seeking student will orally communicate effectively.
3. The degree-seeking student will access, evaluate, and appropriately use information in research and applied contexts.
4. The degree-seeking student will think critically and creatively.

Program Outcomes

In addition to the cross-disciplinary outcomes, the mathematics program at Richland Community College has established some discipline-specific outcomes and goals.

1. **Mathematical Reasoning:** Students will apply mathematical reasoning to solve story problems. This goal is directly measured in this course.
2. **Preparatory Skills:** Students will demonstrate mathematical competencies needed for success in other courses. This goal influences the course, but is not measured directly.

Topical Outline

This course will cover the topics listed below, which are tied to the textbook. The times spent on each topic are approximate as material may be reordered, intermixed, or repeated. In particular, the textbook introduces inference early and includes many of the ideas from probability that are used in inference there, rather than in the separate chapter on probability.

Data – 10 hours

- Introduction to the statistical process
- Context of data including cases and variables
- Classification of data: numeric vs categorical; levels of measurement
- Population vs Sample; Types of sampling, Anecdotal evidence
- Charts and graphs: Frequency tables, scatter plots,
- Relationships between variables: association, causation, scatter plots, explanatory vs response variables
- Observational studies vs experiments.
- Experiments: Control vs treatment, randomized experiments, role of random assignment in establishing cause
- Graphing numeric data: scatter plots, dot plots, histogram, boxplots, choropleths
- Describing numeric data: mean, median, mode, variance, standard deviation, interquartile range, symmetry, skewness, outliers
- Graphing categorical data: frequency tables, contingency tables, bar charts, segmented bar charts, mosaic plots, alternatives to pie chart
- Describing categoric data: proportions, joint probabilities, conditional probabilities

Foundation for Inference – 17 hours

- Null and alternative hypotheses
- Bootstrapping and randomization testing to simulate null hypothesis and create the null distribution
- Probability values and statistical significance
- Type I and II decision errors
- Choosing a significance level and why $\alpha = 0.05$ is the default
- Two-sided hypotheses, two-tailed p-values, and why hypotheses should be formed before looking at the data
- Sampling distributions and the Central Limit Theorem for means and proportions
- Normal distributions, 68-95-99.7 rule
- Standardizing scores, looking up normal probabilities
- Graphical means of checking normality assumption including histograms and probability plots
- Standard errors vs standard deviations.
- Confidence intervals including 2SD rule of thumb for estimating margin of error
- Three approaches to hypothesis testing: confidence intervals, probability values, and classical
- Importance of checking conditions

Probability – 4 hours

- Defining probability: relative frequency, law of large numbers.
- Probability rules: complements, addition rule, multiplication rule
- Conditional probabilities
- Counting techniques: factorials, partitioning (distinguishable permutations)
- Demonstrating difficulty finding exact probabilities and establishing need for simulation and modeling
- Random variables and probability distributions
- Binomial and multinomial distributions.

Categorical Data – 8 hours

- Inference for a single proportion, 1 proportion z-test
- Difference of two proportions, 2 proportion z-test
- Testing for goodness of fit using chi-square, chi-square goodness of fit test
- Testing for independence in two-way tables, chi-square test for association

Numerical Data – 11 hours

- Student's T distributions
- Inference for a single mean, 1 sample t-test
- Paired data, paired samples t-test, dependent means
- Difference of two means, 2 sample t-test, independent means,
- Difference in several means, 1-way ANOVA, 2-way ANOVA

Correlation & Regression – 13 hours

- Line Fitting, residuals, and correlation
- Fitting a line by least squares regression, finding slope and y-intercept
- Types of outliers and their potential problems.
- Inference for linear regression, ANOVA table
- Introduction to multiple regression, table of coefficients, ANOVA table, summary statistics
- Choosing an appropriate multiple regression model

Course Expectations

Student Expectations of Instructor

Here are some things you can expect from the instructor.

- Responses to email or Canvas messages will occur in a timely manner. The goal is within 12 hours during the week and within 36 hours over the weekend. At times, you will find the instructor at the computer and have a response to simple questions within 15 minutes. That is not, by any means, a guaranteed response time, but don't be surprised if it happens. I do

not have a smartphone and am not connected to email 24-7. I do take my laptop with me while traveling, but sometimes hotel internet is flaky. In other words, don't wait until something is due to ask about it. When the problem is too difficult to answer within 12 hours, the instructor will send you a message notifying that it will take longer.

- Assignments will be graded within 3 days of submission. Exams may take longer and the instructor may withhold release of exam grades until all students have completed their exams.
- The instructor will provide guidance and direction on assignments, but will usually steer the student towards the answer rather than just providing the correct answer. Understanding the problem and process is more important than just getting the answer.
- When the instructor makes a mistake, he will admit it and not blame Canvas or other technology for his mistakes. Be aware that the explanation of the mistake may include his frustration with the technology, but he will accept blame if it is really his mistake. If the mistake warrants, adjustments may be made.
- The instructor will treat students with civility and respect.

Instructor Expectations of Student

Here is what is expected out of students in this course.

Students will communicate with the instructor. Life-events happen, but the instructor needs to know about them as soon as possible when they are going to interfere with learning. Do not just disappear from the course for a while and expect to be okay.

- Students will be civil and respectful of all persons in the course.
- Students will monitor Canvas and their student emails and respond to the instructor or other classmates in a timely fashion.
- If a student contacts the instructor for help and then figures it out before the instructor has a chance to respond, the student will notify the instructor that the problem has been resolved or that help in a different area is needed.
- Students will read the book, watch the videos, and read the material in Canvas before contacting the instructor for help. Many of the questions that students have are already answered in the online material and you can find them faster yourself than you can by contacting the instructor and waiting for a response.
- When a student contacts the instructor for help, the student should be prepared to show what has been attempted or already accomplished. If emailing, the student should be specific in his or her requests. Do not send a request for help that just says, for example, "I don't understand Hypothesis Testing," and expect help by email. That is too large of a topic and it is usually just one sticking point that is difficult to self-identify when you don't understand the material. You should meet with the instructor in person in that situation.
- Students will be academically honest in their work. Among other things, this means that you

will complete your own homework and take your own exams. You are welcome to receive help on homework, projects, and discussions, but the exams need to be yours. You may use a calculator on all exams unless otherwise indicated.

- Students will seek help if there are technology issues.

Type of Instruction

Instruction in this course will primarily occur through project-based learning. Along with this, we will use discussion, problem solving, activities, individual and group work, student questions, student participation, reading, interactive quizzing, and lecture. Students are expected to have read the material before class and are strongly encouraged to come to class with a list of questions and to ask these questions. A substantial portion of this class will involve collaborative work with other students.

Students learn the material at a deeper level of processing when they are required to think and draw connections between things. The instructor will rarely answer a question directly because it often leads to superficial memorization and not deeper understanding. Instead, when the student asks a question, the instructor will usually ask one back in an effort to guide students toward making the connections needed to answer the question. In other circumstances, the instructor will direct the student towards asking the correct question to increase understanding.

Method of Evaluation

Evaluation could include any of the following: problem solving exams, objective exams, essays, research papers, oral presentations, group projects, individual projects, participation, activities, quizzes, and homework.

General Philosophy

There will be no traditional, high-stake exams in this course aside from the comprehensive final exam, which only counts as much as two regular quizzes. Those encourage students to put off studying until the exam and statistics, as well as all mathematics, is cumulative in nature. Failure to learn material one week means that you will have trouble understanding the material the next week.

Instead of a few high-pressure exams after a month of material, this course takes the opposite approach and strives to have many frequent, but low-stake assignments. There will be multiple quizzes, projects, weekly discussions, and even some participation points. There will be enough of them that doing poorly on one or two shouldn't seriously impact your final score.

In contrast, that means that you won't be able to sit back and do nothing for a month until the exam comes. There will almost always be something going on in the class. Attendance and active participation in the class will be crucial to your success.

Holistic Grading

This class will involve a lot of writing and explanation of the statistics. There is not always a single correct answer and so interpretation plays a bigger role than it would in an algebra class. That means that much of what you do in this class is subjective, not objective, and that makes grading a little more ambiguous.

To help define grading a little better, there is a rubric that will be applied to discussions and projects in the class. That rubric has just a single row, the overall score. This is called holistic grading – grading on the entire project, not on individual components.

| Rating | Score | Description |
|----------------|--------------|---|
| Awesome | 105% | Exceptional job that really impresses the teacher |
| Good | 90% | Beyond what was required |
| Okay | 75% | Satisfactory completion of requirements |
| Fair | 60% | Almost there, but needs some development |
| Poor | 45% | Minimal attempt at completing assignment |
| None | 0% | Did not participate or submission nowhere close to assignment |

There is also the opportunity for extra credit with each assignment that is graded using this rubric. To get an A, you need to do mostly *good* with an occasional *awesome*.

Homework

Generally speaking, you are not assigned problems from the textbook to work each night like in an algebra class. That said, there may be assignments that you need to work on at home and sometimes bring back to class.

If graded, they will be incorporated into one of the other categories, rather than having a category of their own.

Concepts (45% of grade)

This course will use a non-traditional approach to evaluation. There will be no exams aside from the final exam, instead we will use activities and quizzes to assess your progress and understanding of the material.

Canvas Quizzes

Quizzes within Canvas are the primary method of assessing concepts. These are usually untimed with multiple-attempts and are open for more than one day.

Quizzes typically remain open for at least one day after they are due in case students forget to take the exam or have some situation arise. After that, they are closed and cannot be made up.

Your final score for multiple-attempt quizzes will be the average of the scores on each attempt. Students may have an opportunity to use the highest score instead of the average score on each exam.

Be aware that if you begin a quiz but do not finish it before the time runs out that Canvas will autosubmit it when it is due and give you 0 points for any unanswered questions.

Most of the quizzes start off with instructions about where to look for help working the quiz. You should make sure you read and understand that material before you attempt the quiz. If you miss questions on the quiz, figure out what went wrong before you attempt it again.

Some quizzes have multiple-part questions. When you miss these, Canvas will tell you the score so you can figure out how many parts were right, but not which parts you missed. This is a source of frustration to the students who want to know what they did right so they can focus on what they did wrong. This approach is not good for learning and mastering the material as it discourages establishing the relationships between the parts. Instead, review and rework the entire problem.

In this course, Canvas quizzes may be printed, worked on paper, and then the answers results entered into Canvas. There is no time limit and if you print it out and come back later, you'll be given the same quiz. The quiz only changes once you submit it.

Final Challenge

There are no exams in this course except for the final. It is a multiple choice quiz inside Canvas that counts for 25 points, about double a typical quiz.

It is over the basic level of inference from the fundamentals of hypothesis testing (the stuff we spent 3 months talking about).

The final challenge may not be dropped from the grades.

Projects (35% of grade)

Another major component of the course will be projects.

Projects may be turned in up to two weeks after the due date, but your grade may suffer since it is hard to be *awesome* when it is late.

Some projects will involve posting material to a Canvas discussion for the class to review and provide feedback. This blurs the line between what a project is and what a discussion is and assignments will fall into whichever category seems more appropriate and depending on whether late work will be accepted.

Projects will be graded using the holistic grading rubric described earlier.

No projects will be dropped. No late work will be accepted after May 12.

Discussions (10% of grade)

There will be discussions in this course. There are three purposes for the discussions.

- Critical thinking and consuming statistics.
- Current events or topics from the course.
- Assignments to share with other students and get their feedback. This can be beneficial in multiple ways: you may be the student who needs the help from others or you may be the student who knows what they're doing and other students can benefit from your efforts.

Most of these discussion questions are in post-first format. That means that you post your initial response before you can see what other students have said. Then you carry on a discussion with the class about the question and responses.

Participating in the discussions is not simply a matter of going in and make a post. Neither is there a set number of posts that you must make. Instead, you should establish a pattern of on-going and meaningful communication throughout the allowed time frame. Students who wait until the assignment is almost over to post their comments end up robbing the other students of the ability to reply to their comments, effectively getting the "last word" because of timing, not because of merit.

In an ideal world, students would go into the discussion as soon as it became available and continue to discuss until it was finished. We do not live in a perfect world. What happens is that there is a group of students who only look at the To Do list when deciding when to work on assignments and would wait until the discussion was almost over to write their initial post.

Based on end-of-term feedback from students, we are trying something different this semester with the discussions. The due date in Canvas will be for the initial post rather than for the end of the discussion.

Canvas does not allow multiple due dates for a single assignment, so students will need to remember to participate in the discussion after their initial post.

Discussions will be graded holistically, rather than specifying a certain portion of your grade for the initial post, the follow-up discussion, turning things in on time, and participating on multiple days. So there will be one due date, at the end of the discussion, but realize that you need to be participating in the discussion all week long, not just the day it's due, if you want to get a good grade for it.

The expectation is that once the discussion is over that people will not be going back in and responding, certainly not holding a conversation. For this reason, late work will not be accepted after the discussion closes, which will be a few days after the initial post is due.

The purpose of the discussions is to assist in learning the material. It is not to attack other students or make them feel stupid, but to help them understand while strengthening your own understanding of the material. If you need to disagree with what someone else has posted, then do so with a civil and respectful tone. Understand that your issue is with what the other person has written, not with the other person.

Some projects will involve posting material to a Canvas discussion for the class to review and provide feedback. This blurs the line between what a project is and what a discussion is and assignments will fall into whichever category seems more appropriate and depending on whether late work will be accepted.

All discussion content must be original for this course during the Spring 2023 semester. Do not reuse discussions you have previously used or used in another course.

Discussions will be graded using the holistic grading rubric described earlier.

The lowest scoring discussion will be dropped.

Activities (10% of grade)

Some of these activities will be participation activities where you get full points for completing the activity. Others will be graded based on how well you perform in the activity. You will know which type the activity is before you complete it.

Some activities are time-sensitive and cannot be made up if you miss them. For example, we may gather data in class and then analyze that data; if your data is not included in the analysis because you missed class, then you cannot get the points for the data gathering.

The lowest scoring activity will be dropped.

Grading Policy

Letter grades will be assigned to final adjusted scores as follows:

A: 90–100% B: 80–89% C: 70–79% D: 60–69% F: below 60%

Final scores are rounded to the nearest integer before determining the grade, so a 79.5% will round up to 80% and be considered a "B".

All work must be original and completed during the Spring 2023 semester to receive credit.

Gradebook

All grades will be entered into and maintained within the Canvas learning management system.

When you look at your grades in Canvas, there may be a + or - after the letter grade (example, B+ or C-). The plus or minus after the letter grade is informational and intended to be used as

an encouragement or a warning that you might be able to move up or that you are in danger of slipping down. However, the final grades in the course will not contain a + or a -, just the letter grade, and an 80.1% is as much of a B as an 88.7% is.

Canvas has a What-If feature that allows you to play around with your grades. If you are concerned about your grades, see the instructor.

Grade Changes

Scoring is subject to revision if mistakes are found in the grading. This is especially true with Canvas quizzes where there may be problems with questions that need regrading. Your grade may increase or decrease when this happens. For this reason, you should strive to do better than the minimum needed.

The potential for some extra credit is already built into the system as the grading rubrics for projects and discussions have an *Awesome* category that awards 105% of the possible points. Any interactive classroom assessments that count as a concepts (quizzes) grade will receive a 10% discount to the possible points.

Late Work

Full details about each type of grade, including the late work policy, can be found in the Method of Evaluation section.

Generally speaking, technology or life issues are not an excuse for accepting late work, especially when you have several days to work on something. Procrastination is not conducive for effective learning and should not be encouraged; it has a cascading effect where students continue to fall farther and farther behind.

No late work will be accepted after May 12.

Dropping Grades

There are circumstances that arise during life that may cause a student to miss or do poorly on an assignment. To compensate for these situations, some grades will automatically be dropped.

- The lowest concept (quiz) grade except for the final challenge.
- The lowest discussion grade will be dropped.
- The lowest activity grade will be dropped.
- No project grades will be dropped.

Canvas will drop the assignment that results in the highest score after the drop. This may not be the score with the lowest percentage. For example Canvas may drop an assignment where you scored 70% (70 out of 100) instead of an assignment where you scored 30% (3 out of 10) because the overall score will be higher if the 70% assignment is dropped.

The rules for dropping grades are in place at the beginning of the semester and Canvas will begin dropping grades as soon as there are enough grades in the category to drop some. Do not expect a bump at the end because of dropped assignment grades.

Note that the assignments which are dropped will likely change throughout the semester.

Written Work

All written work should be submitted in electronic form. There should be a cover page with the title of the assignment and the student's name. Headings should be used appropriately to mark-up the document. All reference works used, including books, videos, websites, etc., are to be cited using APA style – do not use MLA. All work is to utilize the English language correctly. It is suggested that the Academic Success Center be utilized for assistance in the preparation of written work. If written work is submitted late, the instructor may take appropriate deductions from the grade.

Attendance / Engagement Policy

Participation vs Attendance

This class expects that you participate, not just that you attend. Participation involves attendance, being familiar with the material, taking notes, reading the book, attempting homework, submitting projects, and participating in discussions.

Attending class without engaging while there does not qualify as participation. Submitting assignments without attending class does not qualify as participation, either. Both are required for participation.

Regular attendance and participation is essential for satisfactory completion of this course. You need to be actively involved in this course several times a week, if not daily. You need to regularly monitor your Canvas inbox and Richland email for notifications and information.

Students who do not communicate with the instructor and have irregular or infrequent attendance, miss the first day of class, or miss any two consecutive days may be dropped.

Students who do not communicate with the instructor, have irregular or infrequent attendance, or are failing before midterm may be dropped from the course. Students who, because of excessive absences, cannot complete the course successfully, are required to be administratively dropped from the class at midterm. If a student stops attending after midterm, it is the student's responsibility to withdraw to avoid an "F". Do not stop participating and assume that you will be withdrawn from the class by the instructor.

Although dropping students for non-attendance at midterm is required, students whose participation in the course is occasional or sporadic may be dropped from the class at any point during the semester at the instructor's discretion. The safest way to make sure you're not

dropped for non-attendance is to continue to actively participate in the course.

The student is responsible for all assignments, changes in assignments, or other information given in the course. Regularly and frequently monitor your communications for updates or changes, but communicate with your classmates to get notes and other information.

Time Requirements

The federal government requires that there is enough material in this course for a typical student to spend a minimum of 12 hours per week working on it.

In [34 CFR 600.2](#), the federal government requires that the amount of student work for a credit hour reasonably approximates not less than one hour of class and two hours of out-of-class work per week for each semester hour. That is, there are three (3) hours of material per week for each credit hour.

Since this is a four (4) credit hour course, you are expected to spend a minimum of 12 hours per week on this course.

If you are taking 15 credit hours, then you should expect to spend at least 45 hours a week on course work. That is the equivalent of a full-time job. The government considers that if you are taking 15 credit hours, then being a student is your full-time job.

According to the federal regulations, this target is a minimum, not an average.

Failure of the course to meet these time requirements could result in loss of program integrity, forcing the college to recover federal financial aid, and ultimately loss of accreditation.

At face value, it sounds overwhelming and impossible, but the time includes reading the book, watching videos, working on homework and projects, and participating in discussions.

The point is to manage your time effectively so that you don't feel the course is overwhelming.

Calculators

A calculator is required for this course. It does not have to be a graphing calculator, but it should be a scientific calculator with the ability to square a number and find the square root of a value. You are responsible for knowing how to use your calculator; if you do not know how to use your calculator, then ask.

Technology

The use of technology in this course is consistent with the Technology Statement in the [Illinois Mathematics & Computer Science Articulation Guide](#) (IMACC, 2019, p. 2). Technology is used to enhance the learning of Statistics, but it is not the focus of the instruction.

This course makes heavy use of technology. It is highly recommended that students be familiar with the following software before attempting this course: e-mail, internet web browser, word processor, spreadsheet, and presentation software. In addition, students should be able to perform file navigation and understand the different types of files and the role of file extensions in naming. Richland offers free workshops for students who need additional computer literacy skills. Students who have weak technology skills may feel overwhelmed by the technology used in the class.

Most of the technology we're going to use is free, open source, or web-based so that there is no additional cost to the students and you can use them after you leave this course. Some software is commercial, but in those cases, Richland Community College has a license to use them. Here is a list of some of the computer packages we may use in this course.

Canvas

Instructure's Canvas project is the learning management system used by Richland Community College.

If there are non-technical issues inside Canvas, like content not appearing or wrong answers on a quiz, please contact the instructor.

If you are experiencing technical issues with Canvas, please click the "Help" link and choose "Report a Problem". The reporting of problems by users is a vital part of how Canvas becomes aware of issues with the system.

Canvas is available at <https://richland.instructure.com>

Minitab

Minitab, version 21, is the statistical software package for this class. It is powerful and makes decent graphs. Minitab is fairly easy to use if you are familiar with a spreadsheet like Excel.

Version 21 of Minitab is an online program that will work with the most up-to-date versions of the Chrome, Edge, or Safari browsers. There are problems if you try to use an older version of a browser. Firefox is not supported. Minitab says that Safari is supported, but in practice there are issues and it is recommended that you use Chrome.

Windows user may download the desktop version of Minitab, but most students choose to use the online version instead.

Use your Richland login to get access to Minitab.

The online version of Minitab is available at <https://app.minitab.com/>

Tableau

Tableau is one of the leaders in the area of business intelligence and analytics. It is much more powerful at visualizing data and telling stories than Minitab or Excel. Many businesses use Tableau to create interactive visualizations and dashboards for their companies. For what it does, Tableau is one of the leading commercial programs.

Tableau is not a statistical analysis program. It is designed to graph and help people discover relationships, but it does not easily find descriptive statistics or conduct hypothesis tests.

Use your Richland email and password to access Tableau.

Tableau has an online app that will run in a modern browser. Tableau is available online at <https://online.tableau.com>

Google Drive

Google has an online system called "Google Drive" (*formerly called Google Docs*) that provides access to documents, spreadsheets, presentations, forms, and drawings. With the exception of the forms, these can be shared and edited by more than one user at a time.

Google Drive also integrates directly with Canvas, so that you can start a Google Doc collaboration from within Canvas and pick the classmates you would like to work with. For this to work, you need a Gmail address and to perform a one-time integration between Canvas and Google Docs.

Most of the data and templates that are provided to the class will be shared through Google Drive.

Google Drive is available at <https://drive.google.com>

Kahoot!

Many students are familiar with Kahoot! Kahoot! is an audience (classroom) response system.

It allows for interactive quizzing, feedback, and participation. It works from desktop computers and mobile devices.

Kahoot is available at <https://kahoot.it>

StatKey

StatKey is an online statistics package written by Lock, Lock, Lock, Lock, and Lock. Although we're not using their textbook, they've made the tool freely available over the Web. We will use this package for randomization testing.

The StatKey software is available at <https://www.lock5stat.com/StatKey/>

Microsoft Excel / Word

Microsoft Excel is a spreadsheet. Since Minitab is commercial software and not widely available, we'll do some work in Excel. Once you leave this class, you are much more likely to use Excel than Minitab or StatKey.

Microsoft Office 365 includes Word, Excel, and PowerPoint and is available free to students enrolled in credit courses at Richland through the Microsoft Student Advantage program. You can download it by logging into <https://office.com> using your Richland email and password and then clicking on Install Office.

If possible, you should install Microsoft Office on your computer rather than using the web app version. Minitab is much easier to use with the desktop version of Word than the online version. The functionality of the online versions of the apps is limited in other ways that may require you to use a desktop version.

Chromebook users will be required to use the online app version of Microsoft Office or the computers in the classroom.

Other Software and Websites

This course is fluid and other software packages or websites may be incorporated into the class.

Additional Supplies

The student should have access to a pencil, paper, and calculator each day. You may occasionally want a ruler or graph paper.

Additional Help

The student is encouraged to seek additional help when the material is not comprehended. Mathematics is a cumulative subject; therefore, getting behind is a very difficult situation for the student. There are several places where you can seek additional help in your classes.

Some services provide a phone number or extension. When only an extension is provided, you will need to first call the main phone number at 217-875-7211.

Instructor

I try to make myself as available to the students as I can. My office hours are listed at the beginning of this syllabus, but those are just the times I'm scheduled to be available to the students. Grab me and ask me questions if you see me in the hallway. Ask questions before or after class. If I'm in my office and it's not my scheduled office hours, go ahead and stop in.

The instructor should be considered the authoritative source for material related to this class. If

a tutor or other student says something that disagrees with the instructor, believe the instructor.

Study Groups

Probably the best thing you can do for outside help is to form a study group with other students in your class. Work with those students and hold them accountable. You will understand things much better if you explain it to someone else and study groups will also keep you focused, involved, and current in the course.

Mathematics Enrichment Center

The Mathematics Enrichment Center, room S102, provides free walk-in tutoring for mathematics courses. They also provide help with study skills and preparation for taking the mathematics placement test.

Contact tutoring@richland.edu for more information.

Testing Center

The testing center is located in room N114. You may be required to use the testing center if you miss an in-class exam or if an online exam needs proctored.

You must provide a photo identification and know the name of your instructor to use the service.

Academic Success Center

The Academic Success Center consolidates several student services into one area. It is located in room S134.

Tutoring

The tutoring center provides tutoring on a walk-in or appointment basis in room S134.

Students seeking mathematics tutoring should visit the Mathematics Enrichment Center in room S102. Evening and weekend tutoring is available via NetTutor inside Canvas. For the current tutoring schedule and study resources, visit

<https://richland.instructure.com/courses/1830817>

Accommodations

The Accommodations Office is located in room S134 and provides support to students with documented physical, psychiatric, or learning disabilities. Students needing accommodation services should visit <https://www.richland.edu/accommodations> or contact accom@richland.edu as early in the semester as possible.

If you request an accommodation, you will be required to provide documentation that you need that accommodation and the instructor will be unable to provide the accommodation until the notified of the accommodations by the Accommodations Office.

Students who have approved accommodations should contact their instructor to discuss the implementation of the accommodations for the course.

Student Tech Support

The Student Tech Support help desk is located inside the Teaching and Learning Center. They provide technical support for students including answering questions about Canvas, myRichland, e-mail, cell phones, tablets, and laptops. They can also help troubleshoot your computer issues and make sure your computer is ready for course work.

They are located in room W202, but the best way to contact them is electronically.

For Canvas-related issues, use the "Help" link in the lower-left corner of Canvas and select Report a problem.

For non-Canvas related issues, email student.tech@richland.edu or visit <https://www.richland.edu/academics/tlc/student-tech-support/>

Open Computer Labs

Students often wish to know where, besides the classroom, they can go to use the software. There are computers located in the Learning Resources Center and in the Academic Success Center that you may use.

Microsoft Office Student Advantage

Currently enrolled students in credit courses may download and install the Microsoft Office software on their personal Mac or Windows devices at no additional cost. To install the software, visit <https://office.com>, log in using your Richland email address and NetID password, and choose "Install Software."

For questions or assistance with Microsoft Office, contact Student Tech Support by email at student.tech@richland.edu, at extension 6376, or in person at the Teaching and Learning Center in room W202.

Richland Thrive

Richland Thrive is an implementation of an early-alert identification and intervention system powered by the Hobsons' Starfish software. The software is designed to help students achieve academic success, retention, and graduation.

When academic indicators suggest a student may be experiencing difficulties that may

negatively impact academic success, the instructor may raise a referral flag that notifies the student of concern through an email to the student's Richland email, requests a Student Success Coach or Student Success staff member contact the student to discuss and follow-up on the issue, or encourages student to discuss the matter with the instructor.

If you receive an email notification of a referral flag in any of your courses, you are encouraged to contact the instructor as soon as possible to discuss the issue. The purpose of the discussion is to accurately assess its potential impact on your academic success and to plan and put into action steps to be successful in the course. For more information about the Richland Thrive system, contact the Student Success Center at ext. 6267.

College & Division Policies

Academic Integrity Policy

All students are expected to maintain academic integrity in their academic work and honesty in all dealings with the College. A student who cheats, plagiarizes, or furnishes false, misleading information to the College is subject to disciplinary action up to and including failure of a class or suspension/expulsion from the College.

The Academic Integrity Policy also governs student misuse of intellectual property.

All work must be original and completed during the Spring 2023 semester to receive credit.

Students who are suspected of violating the Academic Integrity Policy may be required to take quizzes or exams in a proctored setting.

NetID Password and User Account Privacy

Your Richland NetID password should not be shared with anyone. Providing your password or account access to anyone else will be considered a violation of the RCC Academic Integrity Policy and the Responsible Use of Information Technology Policy.

To protect your account, you should always log off of College computers and online systems before exiting a classroom or public location.

Students who are suspected of allowing others to access their account may be required to take quizzes or exams in a proctored setting.

Non-Discrimination Policy

Richland Community College policy prohibits discrimination on the basis of race, color, religion, sex, marital or parental status, national origin or ancestry, age, mental or physical disability (except where it is a bonafide occupational qualification), sexual orientation, military status, status as a disabled or Vietnam-era veteran.

Responsible Use of Classroom Content

Class discussions, papers, pictures, video, and any other work created for a course are all considered official course content. Work including papers, discussions, quizzes, assignments, etc., must be confined to the classroom (either on-campus or virtual) and should not be shared outside the classroom without the express permission of the person who created it. Students should respect the privacy of person-to-person or person-to-class communication in all forms. Violating others' privacy may result in removal from the course. Significant or repeated violations may result in suspension or expulsion. This standard is pursuant to Board Policy 5.8.1 (Responsible Use of Information Technology) and the Code of Student Conduct

Copyright Notice

The materials used in this course are protected by Copyright law. Faculty lectures, course supplementary materials, articles, quizzes and exams, papers, data, web pages, and artwork are among the properties protected. This is not an exhaustive list. Items may or may not be marked with a Copyright symbol ©. Regardless, the intellectual property used in this course is owned by the creator who is the sole determiner of how the property is used, including but not limited to copying, distribution, performance, display, or revisions.

Any questions a student may have about the use of course materials can be explained by the instructor or library staff.

Student misuse of intellectual property is subject to the Academic Integrity Policy as explained in the Student Handbook and Section 5.9 of the Board Policy Manual.

Title IX and Sexual Misconduct

Richland Community College is committed to providing for all students a safe learning environment that is free of all forms of discrimination and sexual harassment, including sexual assault, domestic violence, dating violence, and stalking. If you (or someone you know) has experienced or experiences any of these incidents, know that you are not alone.

All Richland Community College faculty members are "responsible employees," which means that if you tell me about a situation involving sexual harassment, sexual assault, dating violence, domestic violence, or stalking, I must share that information with the Title IX Coordinator. Although I have to make that notification, you will control how your case will be handled, including whether or not you wish to pursue a formal complaint. Richland's goal is to make sure students are aware of the range of available options and have access to the needed resources.

If you wish to speak to someone privately, you can contact Growing Strong Sexual Assault Center at 217-428-0770.

More information about Title IX can be found on Richland's website at <https://www.richland.edu/campus-police>. Richland's Title IX Coordinator is Jenny Reichart, titleix@richland.edu, N186A, phone: 217-875-7211, ext. 6776.

Electronic Communication Devices Policy

The Mathematics, Science, and Business Division prohibits the use of cell phones, pagers, and other non-learning electronic communication equipment within the classroom. All equipment must be turned off to avoid disturbances to the learning environment. If a student uses these devices during an examination, quiz, or any graded activity, the instructor reserves the right to issue no credit for these assignments. The instructor needs to approve any exceptions to this policy.

Richland Community College Core Values

- Commitment - We are dedicated to meeting the needs of the communities we serve.
- Respect - We recognize the expertise of all members of the College community and encourage individual contributions.
- Excellence - We strive to develop and pursue higher standards.
- Accountability - We assume and demonstrate responsibility for our actions.
- Diversity - We believe that our similarities and differences are opportunities for establishing a common bond and strengthening the College.

Other College Services

Richland provides many services to its students. While they may not directly pertain to this class, you may benefit from them. A list of support services with descriptions, phone numbers, and email addresses is found online at

<https://jics.richland.edu/syllabi/mastersyllabus-studentservices.pdf>