MATH 113 – Introduction to Applied Statistics
Summer 2018 Course Syllabus

James Jones, Professor of Mathematics
Mathematics, Science, and Business Division – Richland Community College

Course Meeting Information

Section 01 meets from 8:00 am to 9:50 am on Monday, Tuesday, Wednesday, and Thursday in room S137 on Richland's main campus. This course meets from May 29th through July 19th.

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

Instructor Information

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The best way to contact the instructor outside of class is through Canvas or by email. Please do not leave a voice mail as it will not reach the instructor in time to help you.

Office Hours

Office hours are not required of instructors during the summer term. If you have questions, please make arrangements to see me before class or after class.

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.

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)

To download a free PDF version of the textbook, go to https://www.openintro.org. If you would like a printed (non-color) version of the textbook, it is available on Amazon for $8.49 or from the College Bookstore.

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.

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

The numbered superscripts refer to the Richland Cross-Disciplinary Outcomes addressed by that objective. These Cross-Disciplinary Outcomes are listed at the end of this syllabus.

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, Anecedotal 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 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
- Finding the mean, variance, and standard deviation of a discrete probability distribution

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

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, classroom participation, classroom activities, quizzes, and homework.

General Philosophy

There will be no traditional, high-stake exams in this course. 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 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, instead we will use classroom activities and quizzes to assess your progress and understanding of the material.

The lowest scoring assignment in this category will be dropped. The final may not be dropped.

Interactive Quizzing

These regular assessments will, for the most part, be incorporated into the class presentation. The instructor will ask questions; you will provide feedback, and that will be used to help determine your grade. You will provide your responses electronically so that you can get immediate feedback on whether or not you understand the material and the instructor can get a sense of where the class is. The instructor can then use this information to make adjustments in the schedule. Because these are incorporated into the course, there is no way to make up these assessments if you miss class.

At other times, the feedback will be used to assess how well you have learned and can apply the concepts being taught. In these cases, you will be awarded points for providing the correct answers to the questions. Some instructors drop the lowest quiz (or two), but because these assessments will be worth different amounts of points, that becomes difficult to do. Instead, there will be a 10% grace factor applied to these in-class assessments. That means that if you take a 10 point quiz, it will get recorded in the grade book as being a 9 point quiz. If you happen to score 10 points on it, then you have a little extra to help your grade.

These points cannot be made up if you miss class.

Canvas Quizzes

Quizzes within Canvas may be used to assess concepts as well. These are usually untimed with multiple-attempts and are open for more than one day.

In previous semesters, Canvas quizzes closed as soon as they were due and no late work was accepted since the answers were available. Students waited until the due date to work on the assignment and since it was several days after the material was covered, they said they had forgotten the material.

Based on student feedback, the due date is now sooner, often the next class period after the material is covered. The quizzes will remain open for approximately 2 calendar days after the due date and students may turn it in late during that time. The total time available to complete the quiz is the same, but the due date does not match the availability date.

The answers become available after the quiz closes, so quizzes cannot be made up or completed after they have closed.

There is no 10% discount applied to the Canvas quizzes.

Your final score for multiple-attempt quizzes will be the average of the scores on each attempt. 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 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 and worked out on paper. 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 and that includes the final. Instead, the final will consist of an interactive activity covering the material in the course.

As an interactive event, the final may not be made up if you are absent, but it does receive the 10% discount.

The final challenge may not be dropped from the grades.

Projects (30% of grade)

Another major component of the course will be projects.

Some of these projects will be individual and some of them will involve group work.

Some of the projects will be short-term and groups will usually be randomly assigned based on the people who are in class that day.

You will get to pick your own teams for most of the longer projects. Note that if you miss a lot of days or haven't contributed to your previous groups, you may find it difficult to find a group who wants to work with you and so you may end up working on these projects alone.

Projects may be turned in late, but your grade may suffer since it's hard to be *awesome* when it's late.

If a project involves a class presentation, the presentation portion cannot be made up if missed.

No late work will be accepted after the final.

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

No project grades will be dropped.

Discussions (15% of grade)

There will be discussions in this course. These discussions involve critical thinking, which is difficult to do on the spot, so they will take place within the Canvas learning management system outside of the classroom environment.

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.

This semester, 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.

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

The lowest scoring discussion will be dropped.

Classroom Activities (10% of grade)

Sometimes your responses to quizzes will be used as a participation grade. When this happens, you are awarded points for being actively involved in class and providing feedback. It doesn't matter whether or not you get the right answer and sometimes there won't even be a right answer.

Other times we will be gathering data to use and your participation is needed to help obtain the information. Your level of involvement will help determine the grade for these activities.

There may be activities or worksheets designed to assess how well students are grasping the material. These will be typically be worked at the end of class to provide immediate feedback of a student's understanding.

These points cannot be made up if you are not present to participate.

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".

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. The interactive classroom quizzes get a 10% discount, so that is another opportunity for recovering points.

Late Work

Full details about each type of grade, including the late work policy, can be found in the Method of Evaluation section. This is a summary of the late work policies described there.

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.

- Canvas quizzes (quizzes taken inside Canvas) are open for several days and often allow multiple attempts. Quizzes are open for two (2) calendar days after the due date and then closed and the answers provided.
- In-class quizzes are often given orally with the correct answers given during the quiz and cannot be made up if you are absent.
- Classroom activity points are for active involvement and participation in a class activity. If you are not in class, or physically in class but mentally absent or you are working on something else, you will not receive the points. These points cannot be made up.
- Discussions are designed to be conversations between people. If you wait until the discussion is over to make your posts, it is no longer a discussion, but a monologue or someone getting in the last word. The due date is for the initial post and then the discussion continues for a few days after that.
- Some projects will involve a presentation of your findings or analysis to the class. Because class time is set aside for these presentations, they cannot be made up at another date or

time. No points will be awarded for the presentation if you are not present for the presentation.

- The written portion of projects may be turned in late, but you will likely experience a reduction in grade if they are late.

No late work will be accepted after the final.

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

This is a face-to-face class and attendance is important. We use Canvas, but it is to facilitate the classroom management, not to replace the material covered or instructions given. Turning in the assignments in Canvas does not count as attendance.

Attendance also means more than just being physically present in the room. It involves components of attendance, participation, engagement with others, paying attention, taking notes, and completion of assignments. It means not being distracted by your cell phone, the computer in front of you, or working on material for another course. It even means not working on quizzes or discussions for this course while the class is doing something else.

Attendance is recorded every class period as the percent of the class that where you were present and engaged. If you are physically there but not engaging in the class as described above, this may be recorded as absence.

If you miss the first day of class or any two consecutive days after that without communicating with the instructor, you may be dropped.

Since the course does not directly follow a textbook, attendance is the primary method of obtaining the information in the course. Statistics is a cumulative subject and each day builds on the previous day's material.

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 attending and assume that you will be withdrawn from the class by the instructor.

The student is responsible for all assignments, changes in assignments, or other verbal or written information given in the class, whether in attendance or not. There will be some kind of assessment almost nearly every day as part of the classroom presentation. These may not be made up if you miss class (you may attend the other section of the course on the same day provided that there are available seats).

If a student must miss class, the student should notify the instructor by Canvas or email. Do not call the instructor and leave a message as he will not get it in time to do anything about it.

Time Requirements

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 and that a 50 minute period is acceptable for class or lecture.

Richland considers the minimal meeting time as 50 minutes per week for 15 weeks for each credit hour. Since this course is a four credit hour course, that means 50×15×4 = 3,000 minutes of class time. That is 3000÷60=50 hours of class time.

There is to be a reasonable approximation of two hours of outside time for each hour inside class, so the 50 hours of classroom instruction needs 100 hours of outside work. In total, you should expect to spend a minimum of 150 hours this semester for this course.

This is a summer course and meets for 7.5 weeks, so that time requirement must be accomplished in a shorter period. Dividing the minimum of 150 hours by the 7.5 weeks gives us 150÷7.5=20 hours per week outside of class that you should expect to spend on this course. Note that the 150 hours is a minimum, but that the 20 hours per week is an average.

> You should expect to spend a minimum of 20 hours per week on this course.

Here are some other ways to look at that.

- There are 168 hours in a week and you're expected to put in a minimum of 150 hours for this course. Almost an entire week of your summer will be spent on this course.
- There are 24 hours in a day and you should spend a minimum of 20 hours per week working on this course. Almost one entire day of each week should be spent on this course.

If you are taking 8 credit hours in the summer, then you should expect to spend at least 40 hours a week on course work. That is the equivalent of a full-time job. The government does not intend that you work full time and be a full-time student; that being a full-time 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 outside the class 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. Bring the calculator every day to class.

Most of you will have a smartphone that has a suitable calculator app. The official Mathematics, Science, & Business division policy is to not allow the use of "non-learning electronic devices" within the classroom. While a calculator is preferred, you may use your smartphone as long as it does not become a distraction or impediment to learning.

Collaborative Work

This is an *applied* statistics course. We will be doing several activities and projects in this course that require group work. Some of this time will be spent in the classroom, but there will also be time outside of class required. Computer software will be used for analysis of the data.

Some of these projects will be designed by the instructor and involve the entire class working on the same material. In these cases, the groups will usually be formed using random assignment based on those in attendance. Some of you may get assigned to work with people you would rather not work with. If this happens, please make the best of the situation.

While the teams for the short-term projects are usually randomly assigned, there will be some longer projects that are designed by the students. These projects will incorporate the statistical process of forming of a question, gathering of the data, analyzing the data, and then drawing and presenting the results. For these projects, students will be able to choose their own groups. If you have sporadic attendance or have demonstrated poor teamwork skills in previous groups, you may find that some teams are unwilling to accept you into their group and there is a possibility that you will end up doing the project alone.

Technology

The use of technology in this course is consistent with the Technology Statement in the Illinois Mathematics & Computer Science Articulation Guide (IMACC, 2016, p. 4). 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 18, is the statistical software package of choice 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.

Minitab is installed on the computers in S137, the Academic Success Center, and the Open Computer Lab. Richland's license for Minitab does not allow for home use, but students will be able to get most of their work done at school. There is a 30 day trial version of Minitab available on the web for downloading at http://www.onthehub.com/minitab. You may also purchase a six month copy that will last the entire semester. Minitab 18 is available only for

Windows.

You might see a program called Minitab Express. Although it works with both Windows and Macintosh, it is not as full-featured and they have simplified the interface to the point that it becomes unable to do all that we need it to do.

Google Drive

This class is very collaborative in nature; there will be a lot of group work. In previous semesters, we've used MediaWiki as a collaboration tool, but the learning curve on it was pretty steep and students began to feel the class was about the technology rather than about statistics. Google Drive is very easy for most students to use and so time can be spent on the statistics rather than the technology.

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.

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

Question Press

Question Press is a web-based classroom and audience response system. It allows for interactive quizzing, feedback, and participation. It works from desktop computers and mobile devices and will be the main instrument used for assessing classroom performance.

The instructor's Question Press page is at http://www.questionpress.com/james

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 at http://lock5stat.com/statkey/

Microsoft Excel

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, which includes Word, Excel, PowerPoint, Access, and Publisher, is available free to students enrolled in credit courses at Richland through the Microsoft Student Advantage program. More information is available at https://jics.richland.edu/MicrosoftStudentAdvantage/

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 bring a pencil, paper, and calculator to class each day. You may occasionally want a ruler or graph paper. There will be a paper punch and stapler in the classroom.

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.

You may use a recording device to record the lectures. Feel free to use a camera or cell phone to take pictures of the boards if you have trouble getting all of the information into your notes.

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 in my office. 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, located in W117, provides free walk-in tutoring for mathematics courses. There are additional locations available at the Clinton and Fairview extension centers.

Academic Success Center

The Academic Success Center consolidates several student services into one area. It is located in the south wing of the first floor next to the Kitty Lindsay Learning Resources Center (library).

Testing

The testing center is located in room N114. You must provide a photo identification and know the name of your instructor to use this service.

Tutoring

The tutoring center provides tutoring on a walk-in or appointment basis in room C148. Students seeking mathematics tutoring should visit the Mathematics Enrichment Center.

Accommodations

There are accommodations available for students who need extended time on tests, note takers, readers, adaptive computer equipment, braille, enlarged print, accessible seating, sign language interpreters, books on tape, taped classroom lectures, writers, or tutoring. If you need one of these services, then you should see Learning Accommodation Services in room C148. If you request an accommodation, you will be required to provide documentation that you need that accommodation.

Online Learning

Despite the title, Online Learning provides help with much more than just your online courses. 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 W143, but the best way to contact them is through the "Help" link in the lower-left corner of Canvas or at http://www.richland.edu/online/helpdesk.

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.

College & Division Policies

Academic Dishonesty Policy

Each student is expected to be honest in his/her class work or in the submission of information to the College. Richland regards dishonesty in classroom and laboratories, on assignments and examinations, and the submission of false and misleading information to the College as a serious offense.

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.

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.

Electronic Communication Devices Policy

The Mathematics and Sciences 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.

Other College Services

There are some additional services that Richland provides to its students. While they may not directly pertain to this class, you may benefit from them.

Learning Feedback System

At the end of each semester, students are invited to provide feedback to their instructors about the course. This includes things that went well and opportunities for improvement. This online feedback is anonymous and the instructor won't see it until grades have been turned in.

The Learning Feedback System (LFS) is primarily intended to provide feedback to the instructor. However, if you have a issues or concerns, you should not wait until the end of the semester to talk to your instructor. Please come to me at any time. The feedback system is

available at https://people.richland.edu/feedback.

myRichland

myRichland is the student information system portal and is located at https://my.richland.edu.

You may use it to find the course schedule, register for classes, check your grades, obtain unofficial transcripts, review financial aid, and other student services.

Library

The Learning Resources Center (LRC) has print and electronic resources available. They offer research assistance and information literacy sessions; they also have individual and group study areas.

Student Success Center

The Student Success Center is designed to be a one-stop shop for most student services. These include advising and registration, career services, counseling services, financial aid, veteran affairs, student records, and the transfer center.

A few other student services are located in other rooms of the main building. These include Campus Life, which supports new student orientation, clubs, organizations, and student leadership, and the TRiO program that offers academic and personal support to first-generation, low-income, and students with disabilities.

Directory of Student Services

The main phone number for Richland Community College is 217-875-7211 or 217-875-7200. This is an automated system available 24 hours a day.

Student Service	Location	Extension
Accommodations	C148	6379
Advising and Registration	N116	6267
Campus Life	C131	6243
Career Services	N103	6305
Counseling Services	N117	6267
Financial Aid	N117	6274
Library	C152	6303
Online Learning Support	W143	6376
Mathematics Enrichment Center	W117	6383
Student Employment	N103	6305
Student Records	N117	6257
Student Support Services/TRiO Program	C143	6440
Testing	N114	6238
Transfer Center	N117	6438
Tutoring	C148	6379
Veteran Services	N118	6205

Richland Cross-Disciplinary Outcomes

The course objectives listed in this document make reference to these items.

1. The degree-seeking student will be able to communicate effectively (read, write, speak and listen).
2. The degree-seeking student will think critically and creatively.
3. The degree-seeking student will act professionally and responsibly.
4. The degree-seeking student will manage technology and evaluate information in various research and applied contexts.