

# Syllabus

# STA 2023 - Spring 2016

## 1. Instructional Team:

**Course Coordinator: Maria Ripol**

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**Teaching Assistants:** see Contact Us link in e-Learning

## 2. General Course Information

This course satisfies General Education Credits in the Mathematical Sciences. Students learn how to summarize data and how to make appropriate decisions based on data. This course has a General Education Category of M.

### Course Description

STA 2023 is an introductory course that assumes no prior knowledge of statistics but does assume some knowledge of high school algebra. Basic statistical concepts and methods are presented in a manner that emphasizes understanding the principles of data collection and analysis rather than theory. Much of the course will be devoted to discussions of how statistics is commonly used in the real world. There are two major parts to this course:

**I Data** - which includes graphical and numerical summaries to describe the distribution of a variable, or the relationship between two variables (chapters 1, 2 and 3, approximately 4 weeks), and data production to learn how to design good surveys and experiments, collect data from samples that are representative of the whole population, and avoid common sources of biases (chapter 4, 1 week.)

**II Probability and Inference** - using the language of probability and the properties of numerical summaries computed from a random samples (chapters 5 and 6, 3 weeks), we learn to draw conclusions about the population of interest, based on our random sample, and attach a measure of reliability to them (chapters 7, 8, 9 approximately 8 weeks).

### Course Objective

The primary goal of the course is to help students understand how the process of posing a question, collecting data relevant to that question, analyzing data, and interpreting data can help them find answers to real problems from their world.

### General Education Objective (Mathematics)

Courses in mathematics provide instruction in computational strategies in fundamental mathematics including at least one of the following: solving equations and inequalities, logic, statistics, algebra, trigonometry, inductive and deductive reasoning. These courses include reasoning in abstract mathematical systems, formulating mathematical models and arguments, using mathematical models to solve problems and applying mathematical concepts effectively to real-world situations.

### In this course, this objective will be met by . . .

During the semester the students will be given an introduction to the three main aspects of statistics: design (of experiments/surveys), description (of data collected) and inference (the extension of conclusions from the data gathered in the sample to the larger population). These concepts will be presented through lectures three times a week and lab once a week. They will also learn about the normal and binomial distributions as well as the methodology of confidence intervals and significance tests. From the methods that they learn in class they will be able to critique real world surveys and experiments, interpret graphs in newspapers and magazines as well as conduct basic statistical inference for one or two groups.

## General Education Student Learning Outcomes (SLOs)

**Content:** Students demonstrate competence in the terminology, concepts, methodologies and theories used within the discipline.

**Communication:** Students communicate knowledge, ideas, and reasoning clearly and effectively in written or oral forms appropriate to the discipline.

**Critical Thinking:** Students analyze information carefully and logically from multiple perspectives, using discipline specific methods and develop reasoned solutions to the problems.

### In this course, these SLOs will be met by ...

**Content:** Students will learn critical terminology, concepts, methods, and theories during lecture. These concepts will include terminology to describe one and two samples, discuss surveys/experiments, basic probability theory, sampling distributions, and one and two group inference. The students will be assessed on these terms and concepts during the weekly quizzes and the three exams. Students will also demonstrate their competence in identifying the appropriate formulas to use for each situation and using those formulas correctly.

**Communication:** The students will use verbal and written communication to discuss central statistical concepts in their weekly labs. These concepts include description of data sets, sampling methods and interpretations of inference methodology.

**Critical Thinking:** The students will be asked to critically think about trustworthiness of surveys and experiments presented in the media. Additionally, students will learn how to conduct significance tests, a statistical method to logically determine if there is enough evidence for a hypothesis. Students will learn how to state the null and alternative hypotheses (different perspectives) and then to use the data collected to determine if there is enough evidence to support the alternative hypothesis using methods central to the field of statistics. The students will be tested on these concepts in lab, quiz and on two of the exams.

### Tentative Schedule of Topics

Week 1	Introduction to the field of statistics, Samples vs. Population, Types of Data
Week 2	Graphical Summaries, Summary Statistics
Week 3	Contingency Tables, Least Squares Regression
Week 4	Least Squares Regression, Simpson's Paradox
Week 5	Good Survey and Experimental Design
Week 6	Basic Rules of Probability, Discrete Probability Distributions
Week 7	Normal Distribution, Binomial Distribution
Week 8	Sampling Distribution of the Sample Proportion and the Sample Mean
Week 9	Confidence Interval for the Population Mean and Population Proportion
Week 10	Significance Test for the Population Proportion
Week 11	Significance Test for the Population Mean
Week 12	Comparing Significance Test and Confidence Intervals, Type I and Type II error
Week 13	Comparing Two Independent Proportions
Week 14	Comparing Two Independent Means
Week 15	Comparing Means from Dependent Samples; McNemar's Test
Week 16	Review

## 3. Materials

### Required Lab Workbook

- *Lab Workbook for Statistics: The Art and Science of Learning from Data* by Megan Mocko and Maria Ripol, 3<sup>rd</sup> edition, Pearson.
- Lab Workbook MUST be purchased NEW, and is available alone or bundled with the textbook.
- This workbook includes copies of the lecture notes and all the worksheets for the Lab portion of the course.

### Recommended Textbook

- *Statistics: The Art and Science of Learning from Data* by Alan Agresti and Christine Franklin, 3<sup>rd</sup> edition, Pearson, 2013.
- Textbook can be purchased:
  - as an ebook <http://www.pearsoncustom.com/fl/ufl/stati>
  - hardbound new or used (ISBN: 9780321755940)
  - bundled with the Lab Workbook
  - Notebook Version covering only chapters 1-10 (this is unbound, non-returnable, and suitable only for students that will not take STA3024).

### Scientific Calculator

- You will need a calculator with some basic statistical functions: mean and standard deviation.
- Many inexpensive calculators (around \$15) have these functions; check the manual or look for the following symbols:  $\bar{x}$  and either  $s$  or  $\sigma_{n-1}$
- Graphing calculator will NOT BE ALLOWED on exams.

### 4. Course Website:

**Announcements:** <http://www.stat.ufl.edu/~mripol/2022.htm>

Information for the course, the online lectures for the first week, and important announcements will appear on the course website listed above.

**E-Learning- CANVAS:** <http://lss.at.ufl.edu/>

After the first week of the semester, everything will move to a password protected website in e-Learning, an integrated, Web based classroom management tool. In e-Learning you will be able to:

- check the Announcement page
- check the calendar for upcoming quiz, exam or lab dates
- watch the lectures as streaming video
- take the online quizzes
- check your grades

### 5. Lectures

#### Live Lectures

Live lectures are taught in a large lecture hall that should accommodate everyone who wants to come. Everyone is welcome to attend these live lectures, even those who are registered for a Web class. Lectures will also be taught in a smaller classroom where they will be videotaped. The videotaped lectures will be available to view online through the course webpage in e-learning the same day, before 4pm (usually as soon as the lecture is recorded). No one is registered for this class, but everyone is welcome to attend. However, this room only seats around 25 students, so come early if you are interested.



Period	Lecture	Room
MWF 6	live	Norman 137
MWF 5	videotaping	Norman G 520

### Online Lectures

Links to the videotaped lectures will be found at the course website. You can watch the videos at home - they work best with Internet Explorer. **IMPORTANT - We cannot guarantee that the online lectures will work well for each of you. Be prepared to attend the live lectures if that turns out to be the case.** Some students do not have the discipline to watch and really pay attention to the online lectures, or the videos are too slow. Please remember that everyone is welcome to attend the live lectures, regardless of which section they are registered for. If you're having **technical problems** with the online lectures please contact the UF computer Help Desk for assistance: call (352) 392-HELP (4357) or email: [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu)

### 6. Weekly Lab Sessions in CBD220

Students are required to attend Lab once a week, according to the section for which they are registered. In Lab, groups of around 40 students will meet with a TA to work on a simple, hands-on activity related to the material being covered in class. All Labs meet in Classroom Building 105, room 220 (CBD 220). This building is located half a block north of University Avenue, across from Library West. Worksheets with instructions for each Lab are included in the Lab Workbook. Students must bring these worksheets to Lab each week. The worksheets must be turned in to the TA before leaving Lab that day. They will be graded on a scale of 6 points.

#### Lab Attendance and Policies:

- **Go to the right section.** Students must attend the section they are registered for - you will get no credit for your work if you attend a different section.
- **Be on time.** Students must be on time for Labs, and will not be allowed to enter if they are more than five minutes late. Late students would disrupt the activity, and create problems for the rest of the students and the TA, so it will not be tolerated.
- **Be prepared.** Students must come prepared to Lab, having watched the lectures that cover material relevant to the Lab's activity.
- **Bring the Worksheet.** Students must bring the Lab Worksheet to Lab with them - you will get no credit for hand written labs.
- **No Makeups.** Students will not be permitted to make up any Labs that they have missed, regardless of the reason. Instead, we will drop the lowest three grades for all labs and quizzes combined.

**NOTE:** If you are registered for a lab section that conflicts with another class, or with several night assembly exams for other classes, you **MUST CHANGE LAB SECTIONS IMMEDIATELY**. STA 2023 Labs will never meet on the days we have an exam. There are usually plenty of opportunities to change sections during Drop/Add period. After Drop/Add is over, you will need to contact the Lab Coordinator to see if any changes are possible - see the top of this Handbook for the Lab Coordinator's contact information.

### 7. Weekly Online Quizzes through e-learning

- **When?** We will have online quizzes every week, unless there are exams or holidays. The quizzes

are available online, through e-Learning, over a period of several days - the exact details will be announced in class and posted in the announcement page.

- **Where?** You can do the quizzes from any computer that has internet access.
- **Material.** These quizzes will cover the material taught in class the previous week, and are designed primarily to encourage you to keep up with the lectures, particularly if you choose to watch them on the web at your own pace.
- **Three tries.** You will be allowed three attempts for each quiz - each randomly generated, so the questions won't be identical. The highest grade will be recorded.
- **Getting help.** You are allowed to ask the TA's and the instructor questions about **submitted** attempts on the quiz only. For example, you can take the quiz one time, submit the quiz for grading, and then print out the quiz. You can then bring this printout with you to the tutoring room, where the TA's can help understand what you did wrong. You can then go and try attempt 2 on your own.
- **No makeups.** There will be no makeup quizzes for any reason. Instead, we will drop the lowest three grades for all labs and quizzes combined.
- **Do well.** Given all these opportunities, all students should do extremely well on the quizzes. Hopefully they will serve the purpose of improving your grade in the class, as well as be an important tool in learning the material for the course. You can also print your quizzes and use them to study for exams.
- **Problems?**

**Pop-ups.** If you click on the quiz and nothing happens, you need to allow pop-ups for this website. Firewalls may also interfere with the quizzes.

**Computer crashes** in the middle of the quiz or electricity goes out? Restart the computer and log in again into e-Learning - it should let you continue the quiz. If for some reason, the system does not let you back into the quiz, email the instructor at [mripol@stat.ufl.edu](mailto:mripol@stat.ufl.edu).

**Time Expired.** If e-Learning gives you nasty messages about your time being expired, ignore them, finish the quiz and submit it.

**Technical Problems.** If you have technical problems with e-Learning, contact the CIRCA help desk at 392-HELP. If you are having trouble with the quizzes from your computer at home, and the quiz is about to close, the easiest thing to do is try from another computer.

## 8. Exams

There will be three assembly exams, each worth 100 points. The two midterms are given at night, and the last one during final exam week. Each exam consists of 33 multiple choice questions, each worth 3 points apiece. This will total 99 points. You can earn the remaining 1 point by bringing a picture ID to the exam and by bubbling in your name, UF ID# and test code (listed on the front page of the exam) correctly. Exams will cover a larger amount of material than the quizzes and will also place more emphasis in the understanding of concepts and ideas behind the formulas.

Room assignments for each exam will be announced in class and on the website. The class will be divided up by sections. Bring to the exam your UFID number, a picture ID, no.2 pencils and eraser for completing the bubble sheets, and a scientific calculator. Graphing calculators may be used during the exam, but only for programs native to the calculator when you purchased it. Notes for the course and formulas for the course should not be typed into your calculator. Accessing notes and formulas from the course on your calculator during the exam is cheating. Academic dishonesty on any exam will result in a minimum penalty of a grade of *zero* on that exam.

Exam	Date	Time	Sections in Book	Workbook Pages
1	Wed Feb 17	8:20 -10:00 PM	Ch. 1 -Sec. 6.3	1-48
2	Tue March 29	8:20 -10:00 PM	Ch. 7-Sec. 9.2	49-85
3	Sat April 23	12:30 - 2:10 PM	Ch. 8 - Sec. 10.4	61 -119

## Makeup Exam Policy

- **In case of conflict with a class:** You must attend the regular exam. Assembly exams have priority over regularly scheduled classes. The instructor for the other class must allow you to make up any work you miss because of an assembly exam - contact them early to make arrangements. This is a University of Florida policy, as stated on the Registrar's website [http://www.registrar.ufl.edu/currents/final\\_exams.html](http://www.registrar.ufl.edu/currents/final_exams.html).
- **In case of conflict with another exam:** You must attend the regular exam unless the other exam is also an assembly exam, and the course number is higher than 2023. Assembly exams have priority over time-of-class exams. If you have two assembly exams scheduled for the same day and time, the course with the higher number has priority. This is a University of Florida policy, as stated on the Registrar's website. If you need to schedule a makeup, contact the instructor through email, in person during office hours, or through the phone (information appears at the top of this page). Makeup arrangements must be made at least **ONE WEEK** prior to the regularly scheduled exam.
- **In case of sudden illness or emergency:** Contact the instructor as soon as you realize you will be unable to take the test at the scheduled time. Each case will be reviewed individually. Valid and detailed documentation is a prerequisite for scheduling a makeup exam under such extenuating circumstances. The instructor must be contacted **PRIOR** to the time of the regularly scheduled exam.
- **Format of Makeup Exams** will not necessarily be multiple choice although it will cover the same material as the regular exam.
- **Travel Plans.** Traveling, in general, is not a valid reason to request a makeup exam. Do not buy plane tickets assuming the instructor will then have to make other arrangements for your exam.

## 9. Lecture Notes

The notes in the Lab Workbook will be used in class. When you are following the lectures, whether live or on the web, you should always have the lecture notes in front of you. The instructor will go over the definitions and theory, and work out the examples on the spaces provided.

## 10. Homework and Practice Questions

- **Suggested Homework Problems** from the text, by section, can be found on the course webpage in e-Learning. These problems are assigned to help you master the material and will not be collected. You can get help with these problems from the tutors in the Tutoring Room. Doing the homework is essential step in succeeding in this class.
- **Answers** to odd numbered homework problems are available in the back of the text. Answers to all of the problems are available in the **Instructor's Guide** - copies of this are available in the Tutoring Room, and on reserve at Marston Science Library.

## 11. Minitab Statistical Computing Package

Minitab is a very easy to use and powerful statistical computing package. We will use Minitab in several of our Labs - the teaching assistant will give you directions on how to use it. You can also use Minitab to solve some of the homework problems assigned from the book. The data sets for most homework problems are included in the data disk that comes with the textbook.

Minitab is available free through [UF Apps](#) and at all the PC's (not Macs) on the [Computer Labs](#) on campus. You can also buy it for your home computer (or download the demo version - free for 30 days) at the Minitab website at [www.minitab.com](http://www.minitab.com), or rent a copy of the software for a semester at [www.e-academy.com/minitab](http://www.e-academy.com/minitab).

## 12. Tutoring Room

The TA's for the class will be available to answer questions about the material covered in class, homework problems, etc, in the Tutoring Room located in Griffin Floyd 104. It will be open

approximately 40 hours a week - the schedule for this semester will be posted in e-learning. There is no need to make an appointment, just go whenever it is convenient for you and the TA on duty will help answer your questions.

### 13. Course Assessment

#### Grade Structure:

Exam 1	100
Exam 2	100
Exam 3	100
<u>Labs and Quizzes</u>	<u>100</u>
Total 400	

#### Grading Scale:

Letter Grade	Minimum Points (out of 400)	Percentage Points (rounded off)	Grade Points
A	358	90-100	4.0
A-	346	87-89	3.67
B+	334	84-86	3.33
B	318	80-83	3.0
B-	306	77-79	2.67
C+	294	74-76	2.33
C	278	70-73	2.0
c-	266	67-69	1.67
D+	254	64-66	1.33
D	238	60-63	1.0
D-	226	57-59	0.67
E	0	0-56	0

### 14. Course Policies

- **Privacy Policies:** Student records are confidential. Only information designated “UF directory information” may be released without your written consent. UF views each student as the primary contact for all communication. If your parents contact me about your grade, attendance or other information that is not “UF directory information”. I will ask them to contact you.
- **Email:** Email relating to information about the class should be sent to your TA (see email addresses on first section of this syllabus) or to the instructor at [mrpol@stat.ufl.edu](mailto:mrpol@stat.ufl.edu). Your message will be answered within two working days, in most cases. However, we ask you to please refer to this Syllabus, the Announcement Page and the course website to try to find the answers for yourself. Questions regarding the material covered in class, homework problems, or Lab should be asked in person, in the Tutoring Room, in Lab or in class. Statistical questions often require formulas or pictures, which can make it very hard to communicate by email. Emails should include your full name, and section number. If you are referring to a quiz, refer to it by quiz number, attempt number and question number.
- **Instructor's Honor Code:** We the members of the University of Florida community pledge to hold ourselves and our peers to the highest standards of honesty and integrity.
- **Academic Dishonesty:** We adhere to the University of Florida rules and guidelines for handling instances of academic dishonesty. Please refer to the Office for Student Services for detailed information about the current policies.
- **Students with Disabilities:** Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodations. Students with disabilities

should follow this procedure as early as possible in the semester. This letter must be discussed with the course coordinator directly, not with the lab TA, for accommodations on exams to be made.

- **Class Attendance and Behavior:** Attendance to class is not mandatory, since you will be able to watch the lectures online. Attendance to Lab, however, is mandatory, and you are required to attend the Lab section for which you are registered. For both Labs and lectures, we ask that you arrive on time, and to behave in a respectful manner towards the instructors and your fellow students. In fact, no one will be allowed in Lab if they are more than five minutes late. Please turn your off cellular phones and refrain from eating, drinking, reading newspapers, doing homework for other classes, and excessive talking.
- **Makeup Quizzes and Labs:** There will be NO makeup labs or quizzes under any circumstances - instead, we will drop the lowest three grades for all labs and quizzes combined. These three drops are meant to allow for missed labs or quizzes due to illness, personal or family emergency, personal or University sanctioned travel, religious observance, tardiness, laziness, and all other reasons. **Do not abuse your drops - you never know if you will need them later.**
- **Makeup Exams:** See the section on Exams for exam makeup policy.
- **Grading:** Grades will be changed only when an error has been made; negotiation is not appropriate.
- **Incompletes** are only assigned when extraordinary circumstances (such as an accident, or extended hospitalization), arising after the date for dropping the course, prevent the student from completing the course requirements. Having a failing grade in the course is not a valid reason for requesting an Incomplete.

#### 15. Where to Get Help for this course:

- in class, from your instructor
- in Lab, from your TA
- in the Tutoring Room, Griffin Floyd 104
- for many classes, not just statistics, at the Tutoring Lab in the Basement of Broward Hall - a schedule of their hours can be obtained by calling 392-2010 or by accessing [www.teachingcenter.ufl.edu](http://www.teachingcenter.ufl.edu).
- as a last resort, by getting (and paying) a private tutor. A list of private tutors can be obtained from the Statistics Department secretary in Griffin-Floyd 103.

#### 16. How to do well in the course:

- Keep up with the lectures. Remember everyone is welcome to attend the live lectures. If you choose to watch them online, do it regularly and at normal speed and pay them your full attention.
- Keep up with the course announcements.
- Attend lab regularly, and on time.
- Take the online quizzes early, and use all the attempts necessary to get a good grade on them.
- Do well on the labs and quizzes, and complete them on time. That is the easiest way to improve your grade.
- Work out the suggested homework problems regularly, soon after the material is covered in lecture. Check your answers at the Marsten Science Library or with the TA's in the Tutoring Room.
- Visit the Tutoring Room regularly to get help from the TA's. Their job is to clarify any questions that you may have, and to help you understand the material and learn to do the problems.
- Get to know other students in the class and get together regularly to work on homework problems, and to study for quizzes and exams.

- Prepare carefully for exams by going over the lectures, doing your homework and practice questions, studying your quizzes and reading the book. Pay special attention to the understanding of concepts and ideas behind the formulas.
- If you are having trouble with the class, talk to the instructor in person, early on, to get suggestions on how to do better. Do not wait until the last week to bring any problems to the instructor's attention.