

Syllabus

MAT 103 – 060: MW 1:30-2:45 pm

January 08, 2024 – May 5, 2024

Introduction to Statistics

Reinhardt University

2024 Spring

Room: MC, Tarpley 310

Instructor: Dr. Francesco Strazzullo

E-mail: fs1@reinhardt.edu

Office Hours: please contact me by email with your questions or to set up a video call. We also have a OneNote notebook in Teams (also accessible through Canvas)

Learning Management System and Textbook: Learning assessments (homework and exams) must be completed by using the software Beginning Statistics 3rd Edition by Hawkes Learning Systems (HLS). **An individual license (and access code) for the software is mandatory. The software includes an e-book.** The homework will be completed using an online platform by Hawkes Learning Systems (HLS). You will obtain a **free temporary access through Canvas, using your Reinhardt e-mail address.** This access will be active only for a few days and you will have to purchase a permanent one.

COURSE COVERAGE: Chapters 1-8, and 10-12 (selected topics, see below). These will be covered in four instructional units, distributed in Canvas Modules. In each module you will find a Summary of each unit, where you will see some sections marked as BONUS (likewise in HLS). BONUS means that the topics of a section might be briefly presented in class, but no homework (Certify) will be mandated. NOTE: topics covered in BONUS sections are often helpful to better understand mandatory sections. Your instructor might have to add or remove BONUS sections.

TECHNOLOGY: You must have and use a, like, free for RU students, **or a calculator**, like a TI-83 or above. There is a free PC-emulator version of the TI-83 at

https://eagleweb.reinhardt.edu/ics/Campus_Life/Campus_Groups/Math and in the students' resource module of our Canvas page. Using websites or apps that read questions of tests or homework and give you answers is considered cheating.

1. **A statistics software or calculator are required: I will use MS Excel, GeoGebra, or a TI 84.** Excel and Geogebra are free to RU students, while there is a free PC-emulator version of the TI-83 in the students' resource module of our Canvas page. If you have a different type of **statistics tool** (like an application on a smartphone) then you may use that. Our textbook offers tutorials, in particular for using Excel or a TI-83/84, available at <http://www.hawkeslearning.com/Statistics/beg/technology.html>.
2. **Using websites or apps that read questions of tests or homework and give you answers that you submit is considered cheating.**
3. **HLS is required.**
4. This is a Face-To-Face (F2F) course with online components, and it can be turned to totally online if needed. This course will have a required F2F component that will occur at the specific times and locations indicated above. F2F meetings can be used for direct instruction (like study halls, short lectures, or coding days) or assessments. F2F meetings might be streamed live (synchronous meetings) and they might be also recorded on Microsoft Teams. The online components, direct instruction or assessment, are typically asynchronous (like prerecorded videos, homework, or even exams). For this reasons, students will need to be able to share both video and audio during online meetings, therefore students must have access to a device with a **webcamera and a microphone**. Note that one can log in to Teams meetings from two sources: a computer for ease in utilizing chat functions and seeing the presentation, and a smart device (phone or tablet) to provide audio and video sharing with the conference. If logged in from two devices, please make sure to listen to the audio from the device with the microphone and mute the sound on the other device. This will prevent microphone feedback and echoes. Earphones with microphones (gaming headsets or smartphone earbuds) are recommended.
5. Students will need **internet access and a computer** to submit required files and file types for assignments. To take a WebTest **using HLS and Respondus Lockdown Browser**, Android based operating systems might have incompatibility issues, therefore students should plan for alternatives, for instance using the equipment in our library or our computer labs.
6. For assistance with technology needs, contact the Students Affairs Office at <https://www.reinhardt.edu/student-life/>
7. Students are responsible to check their Reinhardt email and Canvas account several times during the day, for course related updates. Any change to Canvas or Hawkes activities will be notified through Reinhardt email.

I. CATALOG DESCRIPTION: This course is an introduction to elementary descriptive and inferential statistics. Topics include frequency distributions, measures of central tendency and variation, elementary probability theory, binomial and normal distributions, hypothesis testing, tests on two means, sample estimation of parameters, confidence intervals, coefficient of correlation and linear regression. *Prerequisite: University placement, or grade of P, or C or better in any MAT course numbered 100 or above.*

II. CREDIT HOURS: This is a 3 credit-hour course delivered Face to Face (F2F). Over 15 weeks, students will spend 150 minutes per week in classroom instruction, including lectures, class discussions, and examinations (37.5 hours for the semester). Instructional time includes a 1.5-hour final exam. Out-of-class work includes homework and preparation for exams and quizzes and is estimated at around 300 minutes per week (75 hours for the semester).

III. CONCEPTUAL FRAMEWORK:

The science department at Reinhardt University believes that all students should have an exposure to the ideas of science and the scientific method. This includes exposure to laboratory procedures, familiarity with some of the vocabulary of science and ability to read scientific articles in the newspaper or in popular magazines. **The science department at Reinhardt University believes that all students should be familiar with the systematic development of science through history.** This includes an understanding of the effects that science has had on history and that history has had on scientists.

The science department at Reinhardt University wishes to convey to students that science is a continuing endeavor that will not ever be finished. This includes an introduction to the interaction of theory and observation.

IV. COURSE RELATIONSHIP TO CONCEPTUAL FRAMEWORK: This course includes the following methods of instruction: reading assignments and interactive tutorials by HLS (“learn” and “practice”), video lectures on HLS, and discussion forums on Canvas.

V. MATHEMATICS PROGRAM OBJECTIVES: The Mathematics Program at Reinhardt University offers courses geared to

MPO1 Analyze and solve problems by using reasoning, logic and evidence, and by bringing knowledge from a wide range of mathematical areas.

MPO2 Use effective written and oral expression of mathematical concepts in the creation of a mathematical argument by recognizing a wide range of mathematical terms and vocabulary.

MPO3 Apply axiomatic systems.

MPO4 Apply mathematical research methodologies by using libraries, informational technologies, computer programming and numerical methods in order to create solutions to problems.

MPO5 Apply ethical, legal, and policy issues to Information Technology

MPO6 Create IT solutions to solve organizational problems.

VI. MATHEMATICS PROGRAM STUDENT LEARNING OUTCOMES: Taking a course offered by the Mathematics Program, students should be able to

SLO1 Solve a word problem by applying the appropriate mathematical setup, obtaining the mathematical solution, and interpreting this solution in the context.

SLO2 Solve a theoretical problem by identifying the appropriate mathematical context, interpreting the question and the nature of the solution, and checking that the solution is correct.

SLO3 Complete a proof or produce a mathematical object that satisfies specific properties.

SLO4 Solve a problem by consulting various resources, applying appropriate technological tools, and using adequate approximations.

SLO5 Analyze how information technology affects ethical and legal issues.

SLO6 Synthesize appropriate solutions to organizations' problems.

VII. ALIGNMENT TO REINHARDT UNIVERSITY SLO's:

Math PO	Math SLO	RU SLO
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1	1	1, 2, 4
2	2	1-4
3	3	1-4
4	4	1-4
5	5	1-4, 7
6	6	1-4

VIII. COURSE LEARNING OUTCOMES: Passing MAT 103, a student should be able to

1. graphically present statistical data in a number of ways (SLO1, SLO2, and SLO4),
2. evaluate measures of central tendency (mean, median, mode) and variation (standard deviation, range) (SLO1, SLO2, and SLO4),
3. apply basic techniques of discrete probability (sample spaces, addition rules, multiplication rules, conditional probability) (SLO1, SLO2, and SLO4),
4. know the basic characteristics of the binomial distribution, the Poisson distribution and the hypergeometric distribution (SLO1, SLO2, and SLO4),
5. understand and apply normal distributions and the central limit theorem (SLO1, SLO2, and SLO4),
6. evaluate confidence intervals for the mean of a set of data (SLO1, SLO2, and SLO4),
7. apply the basic methods of hypothesis testing (SLO1, SLO2, and SLO4),
8. test the difference between means, variances and proportions (SLO1, SLO2, and SLO4),
9. apply a linear regression analysis (SLO1, SLO2, and SLO4),
10. evaluate chi-squared tests for goodness of fit, independence and homogeneity of proportions (SLO1, SLO2, and SLO4),
11. create and present a report based upon statistics (SLO1, SLO2, and SLO4).

IX. EXPECTATIONS: ATTENDANCE, PARTICIPATION, AND CONDUCT AND WORK POLICY.

Your course grade depends on your active and timely completion of coursework (project, exams, and homework), participation in exchanges of ideas (discussions in class or Canvas), personal observations, and questions regarding the course material with your fellow students and the instructor. As seen on the weekly schedule of course events (below), there are regular activities requiring all students to **complete all three components of each Lesson on HLS**. These are

A. **LEARN**, to be **started** on the week they are scheduled;

B. **PRACTICE**, to be **started** on the week they are scheduled (a good habit is spending at least 20 minutes cumulative on each); and

C. **CERTIFY**, to be **completed** by their due date.

Please be attentive to these assignments and plan on meeting the following **expectations**.

Cell Phone Policy: Please turn off or turn all cellular phones on silent. Do not use them in class without prior permission by your instructor.

Attendance: Students are expected to attend each session. If you miss a class, you are responsible for finding out what was covered and getting the work done.

Late Policy: Work submitted late will be penalized (10% for one day and up to 50% for more than six days) unless there is a documented extenuating circumstance provided to the instructor.

Academic Dishonesty: All students are expected to adhere to the highest standards of academic integrity, and to abide by the Reinhardt Honor Code. Also, all students are expected to be familiar with the Reinhardt policy on academic dishonesty stated in the University Catalog and in the Student Handbook. Plagiarism (using the ideas and phrases of others without crediting them, therefore claiming those ideas and phrases as your own) will not be tolerated in this course or on this campus. To avoid such academic dishonesty, you must use a citation (footnote or

in text) for all ideas drawn from your reading and research, including research in encyclopedias and online, even when you have restated those ideas in your own words. Consequences for cheating or plagiarizing:

a) you will earn a zero for the assignment;

b) the Office of the Vice President for Academic Affairs will be notified of actions taken against students who violate the academic integrity policy, which may result in further consequences, including designation of “academic warning” on your official transcript, academic suspension, or expulsion for academic reasons.

Quality of Student Work: Use of proper grammar, correct spelling, and writing principles are expected in all work. Full credit will not be granted for work that contains grammar or spelling errors.

Study Habits: You are expected to read and study our textbook. Reading (Learn in HLS) a section before it is covered in class is a great habit! For each instructional hour (50 minutes) students are expected to spend a minimum of two hours in independent work activities: therefore, for this class each student is expected to “work at home” for five hours each week. Students are expected to pay attention and participate in class. Use of personal laptops is encouraged, but access to the college computer labs is granted.

Communications: All written communications will be through Reinhardt email.

X. GRADE DETERMINATION: Your grade will be the one reported on Canvas. Your grade will be based on three midterm exams, a final, and homework, with the following weights:

Exams	60%
Unit Tests	40%
Final Exam	20%
Final Project	20%
Discussions	4%
Steps	6%
Presentation	2%
Paper	8%
<u>Homework</u>	<u>20%</u>
Total	100%

Homework: Certify. You will be assigned “Lessons” through Hawkes Learning Systems (HLS), 27 mandatory ones as scheduled below. You need to complete each assignment by its due date (reported on HLS), usually a **Wednesday** or a **Sunday night at midnight**. The goal of these assignments is to help you better understand the material covered in this course. This is the number-one-way to get a good grade in this class – do your homework each day and then you will be ready to learn the new information. It is much more difficult to catch up then to keep up! Homework will be graded by the software and you will receive an immediate feedback. Please, use all the tools available to you in order to succeed in this course. Late homework will be penalized. Homework can be completed before its due date. **Some sections are marked as BONUS** (about 28) and completing them will give you extra points for Certify (HLS). **This portion of your course scores is capped at 125%.** You are encouraged to read the Bonus sections, but you do not have to complete their associated homework. **You will not be directly tested on topics included in the Bonus sections, but their content might help you better understand our mandatory sections.**

Exams: These are four exams, three Unit Tests (Tests) and one Final Exam (Final). The lowest exam score will be dropped. Tests can be taken in 70 minutes, at class time (see below). No make-up exam will be given. The Final will be comprehensive, and it will be taken in 90 minutes (see below).

Web-Test. If needed, a test might be given online, in HLS. If you have an online test, once started, a Web-Test must be completed within the time limit AND the due time. For instance, a Web-Test due by Tuesday at 11:59 PM should be started not later than Tuesday at 10:59 PM in order to have the full hour available, but it is a good habit to start such a test at least 3 hours before it is due, to account for possible technical issues. A Web-Test is first scored by HLS, but your instructor will review it for partial point’s corrections based on your exam worksheets. For instance, you might enter 2.3 as an answer instead of 2.28, and you might get a score of 0 in HLS because of this, but your instructor can override this score by granting partial points based on the work shown on your worksheets. **The time allowed on Exams takes into account also the time required to take pictures, which should be uploaded in Canvas within 5 minutes from the completion of a test** as described next.

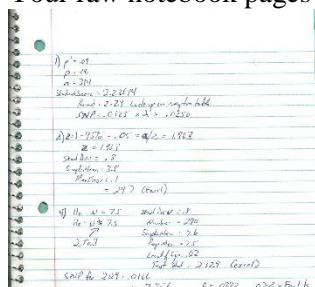
Exam Worksheets and Pics: With the exception of Test1, all our exams will be F2F, paper-pencil.

If a Test is completed online, then you must upload in Canvas images of each of your exam’s worksheets, one

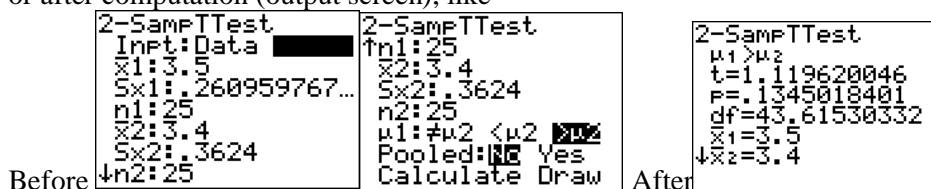
image for each page, all in one single file (docx, pptx, or pdf); with each worked out exercise numbered as it appears online. **If you don't upload any image by the due date, a zero will be assigned to your exam in Canvas until your instructor will record your HLS score in Canvas, with a 30% penalty.**

Note that many computations are expected to be performed by using technology; you do not need to show your arithmetic, but the tools you use. **For an online exam** you must upload the following images (using your phone or a computer's snapping tool), embedded in one single (docx, pptx, or pdf):

1. Your raw notebook pages with numbered exercises, like



2. A snapshot of the electronic tool used (TI-83/84 or Excel for instance) before computations (input call) or after computation (output screen), like



3. Use Respondus and either complete the Show your Work step there or include with your worksheets a selfie with one submission page of the test in the background.

Final Exam Exemption: If after Test3 and your Final Project are graded (and considering all three midterms) you have earned at least 82% of all available points as shown on Canvas, then **you may exempt the final exam** (your lowest test score will be counted as final exam score, with the appropriate weight) and your current score will be your final course score. **If exempt from them Final you will be notified by email in Canvas, and by November 26th you must communicate to your instructor if you accept your exemption.**

Final Project: Your final project must be a **quantitative analysis** of data, written in a report form (student paper), completed with three intermediate steps (**Steps**). Chapter 1 (in particular sections 1.3 and 1.4) gives you fundamental ideas/indications of what you should produce. Some Bonus Appendix sections provide more details and examples. Your report must be in APA format and must be suitable for presentation to a supervisor or to the public. If you have some data available from a place of employment, you may use it as long as you have written permission by your employer. Your project should include graphical and numerical data as well as explanatory text. **You will have to use inferential statistics and some hypotheses testing technique** (Chapters 7, 8, and 10 to 12). A title page and a statement of the problem should also be included. You will upload your report as a Windows Word document through the Coursework tab in Canvas. A grading rubric for this project is posted on Canvas, together with exemplars. **Note: your final project is a semester long assignment.** Through our weekly discussions on Canvas, you will be asked to update the whole class about various parts (Steps) of your report. Your class participation (discussions) is worth 20% of these assignments. Some exemplars of completed reports are on our Canvas page.

X. GRADING SCALE: A=[90, ∞), B=[80, 90), C=[70, 80), D=[60,70), F=[0, 60)

XI. Learning Support: The Center for Student Success (CSS) is located on Main Campus (Waleska, GA). The CSS offers **free peer and faculty tutoring for all subjects**, and students can ask about online support. For information, go to Reinhardt webpage and click [Center for Student Success](#).

XII. ADA and ASO: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. This legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. Reinhardt University is committed to providing reasonable accommodations for all persons with

disabilities. Therefore, if you are seeking classroom accommodations under the Americans with Disabilities Act, prior to contacting me you are required to register with the **Academic Support Office (ASO)**. ASO is located in the basement of Lawson Building. Phone is 7707205567. To receive academic accommodations for this class, please obtain the proper ASO letters.

XIII. OFFICE HOURS AND SCHEDULE: I can assist you online as well. There are several tools we can use, one of them is OneNote online. I will set up a session when needed.

XIV. PROJECTED COURSE OUTLINE (subject to change at instructor's discretion)

Week/date	Class Coverage	Special events
01: Jan 08 – 14	Syllabus, 1.2, 1.3	Discussion1
Jan 15		MLK Day - University Closed
Jan 16		Final day to change schedule, end of drop/add.
02: Jan 15 – 21	2.1 to 2.3	Discussion2
03: Jan 22 – 28	3.1 to 3.3	Discussion3
04: Jan 29 to Feb 04	4.1, 4.2	
05: Feb 05 – 11	4.3, 4.4	Step1 closes on Sunday
06: Feb 12 – 18	5.1, 5.2	Test1 (Chapters 1 to 4) Discussion4
07: Feb 19 – 25	6.1 to 6.3	
08: Feb 26 to Mar 03	7.2	Step2 closes on Tuesday
Mar 04 – 10		SPRING BREAK
Mar 07		Mid-term grades posted
Mar 12		Final date to withdraw with grade of W
09: Mar 11 – 17	Review for Test2	Test2 (Chapters 5 to 7)
Mar 18 – 28		Advising/Registration for Spring/Summer 2024
10: Mar 18 – 24	8.1, 8.3	Discussion5
Mar 29		Good Friday - University Closed
11: Mar 25 – 31	10.1, 10.2	
12: Apr 01 – 07	10.6, 11.1, 11.2	Step3 closes on Wednesday
13: Apr 08 – 14	12.1, 12.2	Test3 (Chapters 8 to 12); Discussion6
14: Apr 15 – 21	Final Projects presentations	Discussion7; Final Project due
15: Apr 22 – 23	Final Projects presentations	Our Last Day of Class
Final Exam: in Tarpley 310, Thursday April 25th, 4:00 PM – 5:30 PM.		

If exempt from Final Exam, you must notify your instructor of your selection by April 22nd.