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👨‍👨‍👧‍👧 “Please remember me and my family in your prayers.” 🌸

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General Studies

MATH 1281 Statistical Inference

UNIVERSITY OF THE PEOPLE
The Education Revolution

MATH 1281: STATISTICAL INFERENCE

Syllabus

Prerequisites: MATH 1280 Introduction to Statistics

Course Description: This course covers inferential statistics, estimation, and hypothesis testing. The emphasis in the course is on the presentation of statistical methods and on the interpretation of the outcome. This course considers inferential statistics: point estimation, confidence intervals, hypothesis testing, tests for goodness of fit and independence, power calculation and ANOVA, linear regression, multiple regression, and logistic regression. The JASP software is used as part of the teaching. By the end of this course, students will be fully equipped to analyze data and use it to make inferences and conclusions about real world phenomena.

Required Textbook and Materials: UoPeople courses use open educational resources (OER) and other materials specifically donated to the University with free permissions for educational use. Therefore, students are not required to purchase any textbooks or sign up for any websites that have a cost associated with them. The main required textbooks for this course are listed below and can be readily accessed using the provided links. There may be additional required/recommended readings, supplemental materials, or other resources and websites necessary for lessons; these will be provided for you in the course's General Information and Forums area, and throughout the term via the weekly course Unit areas and the Learning Guides.

- Diez, D., Cetinkaya-Rundel, M., Barr C. D., & Barr, C. D. (2019). *OpenIntro statistics - Fourth edition.* Open Textbook Library. Please access it from the homepage.
- Goss-Sampson, M. A. (2022). *Statistical analysis in JASP: A guide for students* (5th ed., JASP v0.16.1 2022). Please access it from the homepage.

Learning Objectives and Outcomes:

By the end of this course students will be able to:

1. Define different methods for statistical inference: point estimation, confidence intervals, and hypothesis testing.
2. Recognize and use models for describing relations between measurements.
3. Apply and interpret the outcomes of statistical inference.
4. Explain the assumptions behind various procedures for inference.
5. Apply JASP to summarize data numerically and visually, and to carry out statistical analysis.

Course Schedule and Topics: This course will cover the following topics in eight learning sessions, with one Unit per week. The Final ? n will take place during Week/Unit 9 (UoPeople time).

Week 1: Unit 1 - Foundations for Inference & Introduction to Jeffrey's Amazing Statistics Program (JASP)

Week 2: Unit 2 - Hypothesis Testing and Inference for categorical data

Week 3: Unit 3 - Testing for goodness of fit and Independence

Week 4: Unit 4 - Inference for numerical data

Week 5: Unit 5 - Power Calculations and ANOVA

Week 6: Unit 6 - Introduction to Linear Regression

Week 7: Unit 7 - Linear Regression Inference and multiple regression

Week 8: Unit 8 - Logistic Regression

Week 9: Unit 9 - Course Overview and Final Exam

Learning Guide: The following is an outline of how this course will be conducted, with suggested best practices for students**.**

Unit 1: Foundations for Inference & Introduction to Jeffrey's Amazing Statistics Program (JASP)

- Read the Learning Guide and the Reading Assignments
- Participate in the Discussion Assignment (post and comment in the Discussion Forum)
- Complete and submit the Learning Journal
- Take the Self-Quiz

Unit 2: Hypothesis Testing and Inference for categorical data

- Read the Learning Guide and Reading Assignments
- Participate in the Discussion Assignment (post and comment in the Discussion Forum)
- Complete and submit the Learning Journal
- Take the Self-Quiz

Unit 3: Testing for goodness of fit and Independence

- Read the Learning Guide and Reading Assignments
- Participate in the Discussion Assignment (post and comment in the Discussion Forum)
- Complete and submit the Learning Journal
- Take the Self-Quiz
- Take the Graded Quiz

Unit 4: Inference for numerical data

- Read the Learning Guide and Reading Assignments
- Participate in the Discussion Assignment (post and comment in the Discussion Forum)
- Complete and submit the Learning Journal
- Take the Self-Quiz

Unit 5: Power Calculations and ANOVA

- Read the Learning Guide and Reading Assignments
- Participate in the Discussion Assignment (post and comment in the Discussion Forum)
- Complete and submit the Learning Journal
- Take the Self-Quiz

Unit 6: Introduction to Linear Regression

- Read the Learning Guide and Reading Assignments
- Participate in the Discussion Assignment (post and comment in the Discussion Forum)
- Complete and submit the Learning Journal
- Take the Self-Quiz
- Take the Graded Quiz

Unit 7: Linear Regression Inference and multiple regression

- Read the Learning Guide and Reading Assignments
- Participate in the Discussion Assignment (post and comment in the Discussion Forum)
- Complete and submit the Learning Journal
- Take the Self-Quiz

Unit 8: Logistic Regression

- Read the Learning Guide and Reading Assignments
- Participate in the Discussion Assignment (post and comment in the Discussion Forum)
- Complete and submit the Learning Journal
- Take the Self-Quiz
- Read the Unit 9 Learning Guide carefully for instructions on the Final Exam
- Take the Review Quiz

Unit 9: Course Review and Final Exam

- Read the Learning Guide and take the Review Quiz, if you haven't already done so
- Prepare for, take, and submit the Final Exam
- The Final Exam will take place during the Thursday and Sunday of Week/Unit 9 (UoPeople time); exact dates, times, and other details will be provided accordingly by your instructor

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Course Requirements:

Discussion Forum Assignments
Some units in this course require that you complete a Discussion Assignment. You are required to develop and post a substantive response to the Discussion Assignment in the Discussion Forum. A substantive response is one that fully answers the question that has been posed by the instructor. In addition, you must extend the discussion by responding to at least three (3) of your peers' postings in the Discussion Forum and by rating their posts. Instructions for proper posting and rating are provided inside the Discussion Forum for each week. Discussion Forums are only active for each current and relevant learning week, so it is not possible to contribute to the forum once the learning week has come to an end.

Learning Journals
Learning Journal is graded by your instructor. The grading rubric is listed under the assignment instructions. The grading rubric is a document that outlines the criteria that your instructor will use to grade your work.

Quizzes
This course will contain three types of quizzes – the Self-Quiz, the Graded Quiz, and the Review Quiz. These quizzes may contain multiple choice, true/false, or short answer questions. The results of the Self-Quiz will not count towards your final grade. However, it is highly recommended that you complete the Self-Quiz to ensure that you have adequately understood the course materials. Along with the Reading Assignments, the results of the Self-Quiz should be used as part of an iterative learning process, to thoroughly cover and test your understanding of course material. You should use the results of your Self-Quiz as a guide to go back and review relevant sections of the Reading Assignments. Likewise, the Review Quiz will not count towards your final grade, but should also be used to assist you in a comprehensive review and full understanding of all course material, in preparation for your Final Exam. Lastly, the results of the Graded Quiz will count towards your final grade.

Final Exam
The Final Exam will take place during the Thursday and Sunday of Week/Unit 9, following the completion of eight units of work. The format of the Final Exam is similar to that of the quizzes and may contain a combination of different question types. You will have one attempt to take the exam, and it will be graded electronically. Specific instructions on how to prepare for and take the Final Exam will be provided during Week 8 (located inside the Unit 9 Learning Guide). Final Exams must be taken without the use of course learning materials (both those inside and outside the course). If particular materials are allowed for use during the exam, these will be noted in the exam's instructions.

Class Introductions
This section is your opportunity to introduce yourself to your classmates and create a vibrant learning community. By sharing your background, interests, and goals, you can create meaningful connections and discover commonalities with your peers.

Course Forum

The Course Forum is the place to raise issues and questions relating to the course. It is regularly monitored by the instructors and is a good place to meet fellow students taking the same course. While it is not required to participate in the Course Forum, it is highly recommended.

Assignment Submission

Accepted file formats for assignments are Microsoft compatible, PDF, or as specified in the course and activity instructions. Do not password-protect your files. Screenshots of computer coding, mathematical formulas, or images with sentence structures (typed or handwritten) are not allowed, unless otherwise stated in the assignment instructions.

Course Policies:

Grading Components and Weights

Each graded component of the course will contribute some percentage to the final grading scale, as indicated here:

Learning Journals (8)	45%
Discussion Assignments (8)	15%
Two Graded Quizzes (2 of 10% each)	20%
Final Exam (1)	20%
TOTAL	**100%**

Grading Scale

This course will follow the standard 100-point grading scale defined by the University of the People, as indicated here:

Letter Grade	Grade Scale	Grade Points
A+	98-100	4.00
A	93-97	4.00
A-	90-92	3.67
B+	88-89	3.33
B	83-87	3.00
B-	80-82	2.67
C+	78-79	2.33
C	73-77	2.00
C-	70-72	1.67
D+	68-69	1.33
D	63-67	1.00
D-	60-62	0.67
F	Under 60	0.00

Grade Appeal

If you believe that the final grade you received for a course is erroneous, unjust, or unfair, please contact your course instructor. This must be done within seven days of the posted final grade. For more information on this topic, please review the Grade Appeal Procedure in the University Catalog.

Participation

Non-participation is characterized by lack of any assignment submissions, inadequate contributions to the Discussion Forums, and/or lack of peer feedback to Discussion/Written Assignments. Also, please note the following important points about course participation:

- Assignments must be submitted on or before the specified deadline. A course timeline is provided in the course schedule, and the instructor will specify deadlines for each assignment.

- Occasionally there may be a legitimate reason for submitting an assignment late. Most of the time, late assignments will not be accepted and there will be no make-up assignments.
- All students are obligated to inform their instructor in advance of any known absences which may result in their non-participation.

Academic Honesty and Integrity

If and when you submit any work that requires research and writing, it is essential to cite and reference all source material. Failure to properly acknowledge your sources is known as "plagiarism" – which is effectively passing off an individual's words or ideas as your own. University of the People adheres to a strict policy of academic honesty and integrity. Failure to comply with these guidelines may result in sanctions by the University, including dismissal from the University or course failure. For more information on this topic, please review the Academic Integrity Policy in the University Catalog.

Any materials cited in this course should be referenced using the style guidelines established by the American Psychological Association (APA). The APA format is widely used in colleges and universities across the world and is one of several styles and citation formats required for publication in professional and academic journals. Refer to the UoPeople APA Tutorials in the LRC for help with APA citations.

Code of Conduct

University of the People expects that students conduct themselves in a respectful, collaborative, and honest manner at all times. Harassment, threatening behavior, or deliberate embarrassment of others will not be permitted.

Any conduct that interferes with the quality of the educational experience is not allowed and may result in disciplinary action, such as course failure, probation, suspension, or dismissal. For more information on this topic, please review the Code of Conduct Policy in the University Catalog.