Statistical Methods

The University of Toledo
Department of Psychology
PSY 2100, CRN 41002, Section 002

Instructor:	Dr. Gregory Meyer	**Class Day/Time**:	T R 2:30-3:50 pm
Email:	gregory.meyer@utoledo.edu	**Lab Location**:	NA
Office Hours:	M 2:00-4:00 pm by appointment	**Lab Day/Time**:	NA
	F 10:00-1:00 pm Grad only; by appt.	**Credit Hours**:	3
Office Location:	UH 1065 (1st floor, east side)	**TA**	Kristina Todorovic, M.A.
Instructor Phone:	(419) 530-4312	**Office**:	UH 1900A (1st floor, west side)
Offered:	Fall 2019	**E-mail**:	Kristina.Todorovic@rockets.utoledo.edu
Course Website:	Blackboard Learn	**Office hours**:	W 10:00am-1:00pm, F 9:00-10:30am
Class Location:	UH 5150F		

CATALOG/COURSE DESCRIPTION*

Descriptive and inferential statistics as applied to research in basic behavioral science and to clinical research. Students are encouraged to take PSY 3120 Understanding Psychological Research before taking this course.

COURSE OVERVIEW

This course provides a basic understanding of the statistics used most commonly by social scientists. Topics to be covered include summarizing data with graphs and numbers, generalizing from samples to a population, and determining the effect of one variable on another. The course will also allow you to understand research reports in social science publications and in the press. We will particularly emphasize the application of statistics, and using and interpreting statistics as opposed to the mathematical proofs underlying these statistical methods. Even students who say they have "math anxiety" can excel in this class, if they are willing to keep up with the work.

STUDENT LEARNING OUTCOMES*

By the end of this class, you should be able to:
1. summarize and organize data;
2. select and calculate an appropriate statistic to decide whether one variable reliably affects another variable, or whether such findings are driven by chance;
3. critically evaluate research findings in scientific journals and in the media;
4. work with the SPSS statistical software program; and
5. possess a basic understanding of statistics that can be built upon in future research design and statistics classes.

TEACHING METHODOLOGY

This class is largely lecture format, accompanied by periods of hands on data management or statistical analyses with SPSS on the classroom computers. You will receive homework assignments for each topic we cover, and there are four exams. Reading the textbook, attending every class, asking questions when something is unclear, and successfully completing each homework are the keys to successful performance on exams and in the class overall. I do not take attendance and make the slides I lecture from available to students. In the past, this has left some students thinking (or hoping) that they could just skip class altogether, or get by without reading the textbook. Believing this is pretty much a guaranteed way to ensure you will fail the course. It is essential to read the textbook and attend class.

PREREQUISITES AND COREQUISITES*

C- or better in Math 1320 or a higher level course (e.g., 1340)

TEXTS AND ANCILLARY MATERIALS*

Nolan, S. A., & Heinzen, T. E. (2017). *Statistics for the behavioral sciences* (4th edition). New York, NY: Worth. See also the LaunchPad online supplement: https://tinyurl.com/y4nfejfb (6 months for $90).

Required Calculator: Nothing fancy; just needs a square root function. However, you cannot use a phone app.

TECHNOLOGY REQUIREMENTS

Some coursework will require SPSS for statistical data analysis. Students can access SPSS in multiple ways through on-campus resources. The psychology department provides access through the lab in UH5000, which is open this fall as follows: M 8:30 – 5:00, T 8:00 – 4:00, W 1:00 – 6:00, and R 11:00 – 6:00. SPSS also is available in other labs (https://libguides.utoledo.edu/stats-software/SPSS), for download (https://www.utoledo.edu/it/students.html), and remotely accessible at any time via the academic UT Virtual Lab (http://www.utoledo.edu/it/VLab/). General UT technology info is here: http://www.utoledo.edu/dl/students/required-info-online-learners.html.

ACADEMIC POLICIES*

All students at the University of Toledo must read, understand, and follow the academic policies that govern their attendance at the University. These policies include, but are not limited to, academic dishonesty, academic forgiveness, adding and dropping a course, grades and grading, and the missed class policy. Please use the following URL to read a comprehensive list of academic policies that pertain to you in this class and throughout your time at UT: http://www.utoledo.edu/policies/academic/undergraduate/. If you have any questions after reading through the policies, please let me know.

COURSE EXPECTATIONS

- Attend class, read the book, complete homework, ask questions when unsure, and complete exams.
- Communication about class will take place by email; be sure to check your UT email.
- Arrive on time and do not leave early.
- The class computers are to use for class-relevant activities, which include SPSS, Blackboard, and notetaking.
- Please turn off cell phones when entering class.
- No browsing the internet while on the computer during class.
- No talking after class starts unless it is for an assignment or you are asking a question about class material.
- Instructor office hours are by appointment during the designated time.
- TA office hours are "drop in," they do not require an appointment.

OVERVIEW OF COURSE GRADE ASSIGNMENT*

Exams

There will be 3 regular exams during the semester plus 1 final exam. Each regular exams is worth 100 points; the final is worth 150 points. The exams consist of a combination of multiple-choice, calculation, and essay-style questions. Each of the regular exams will cover information presented in class and on assigned readings *since* the previous exam; they are non-cumulative. The bulk of the final exam is also non-cumulative, with exception of a 50-point section where you will identify what type of statistical test discussed during the semester to use for particular examples (I will say more about this later). You must bring a photo ID, pencil, and calculator to each exam. Do not miss an exam. They will only be rescheduled if you have documentation about a legitimate, university-sanctioned reason for missing the exam. If you can anticipate that you must miss an exam (e.g., for a participatory athletic event, religious holiday), contact the TA and me by email at least *one week before* the exam. If you are unable to take an exam on time due to illness or emergency, notify us *before* the exam starts by sending an email or calling our offices, providing a valid reason for missing that day. Be prepared to take the make-up exam at the earliest possible date (to be taken at the Field House Testing Center on the Main Campus). Is you do not follow these procedures, you will not be allowed to make up the exam.

Homework Assignments

Homework is essential for success in this course. Nothing is more important. The assignments solidify your understanding of the course material. There will be 10 assignments worth 10 points each. Assignments will be

posted on the course website 1 week prior to the listed due date. You will upload and submit homework (and any other materials for class) to Blackboard prior to the beginning of class. If you anticipate missing a homework assignment, please notify us via email at least *one week prior* to the assignment's due date. If you are ill or have an emergency on a day that a homework assignment is due, you must notify us *before* class and be prepared to hand in your assignment as soon as possible. It is very important to stay caught up with the assignments. If you do not upload an assignment on time and do not contact us in advance with a valid reason (as noted above), we will deduct 2.5 points for each starting class time that passes before you upload it. Thus, if you upload it after class starts, it will be worth up to 7.5 points; if it is 1 week late, it will be worth up to 5 points; if uploaded 2 weeks late or more, it will be worth 0 points.

Grading Policy
You earn points in the class as follows:

Assignment	Possible Points
3 Regular Exams - 100 points each	300 points
1 Final Exam – 150 points	150 points
10 Homework Assignments - 10 points each	100 points
Total	**550 points**

Midterm Grading*
Midterm grades are assigned the 8th week of class and they are used to help you determine your academic standing. I also record your attendance during the 8th week to meet state and federal laws regarding financial aid disbursement. If you are not attending class, it could affect your financial aid. If you decide you are not going to attend this class, you must formally withdraw (drop) from the course. You can do this by logging onto the myUT portal, clicking on the "Student" tab, and then under "My Toolkit" click on Register/Drop/Withdraw.

I will calculate your midterm grade based on the first five homework assignments (50 points) and the first exam (100 points). Thus, those grades will be determined by what you accomplished out of 150 possible points.

Final Grading*
Final Letter Grades and Their Percentage and Point Values

A	93+%	≥ 512	C	73-76.9%	402-423
A-	90-92.9%	495-511	C-	70-72.9%	385-401
B+	87-89.9%	479-494	D+	67-69.9%	369-384
B	83-86.9%	457-478	D	63-66.9%	347-368
B-	80-82.9%	440-456	D-	60-62.9%	330-346
C+	77-79.9%	424-439	F	< 60.9%	≤ 329

UNIVERSITY POLICIES*

Policy Statement on Non-Discrimination on the Basis of Disability (ADA)*
The University is an equal opportunity educational institution. Please read The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance.
Students can find this policy along with other university policies listed by audience on the University Policy webpage (http://www.utoledo.edu/policies/audience.html/#students).

Academic Accommodations*
The University of Toledo embraces the inclusion of students with disabilities. We are committed to ensuring equal opportunity and seamless access for full participation in all courses. For students who have an accommodations memo from Student Disability Services, I invite you to correspond with me as soon as possible so that we can communicate confidentially about implementing accommodations in this course. For students who have not

established affiliation with Student Disability Services and are experiencing disability access barriers or are interested in a referral to healthcare resources for a potential disability or would like information regarding eligibility for academic accommodations, please contact the Student Disability Services Office (http://www.utoledo.edu/offices/student-disability-services/) by calling 419.530.4981 or sending an email to StudentDisability@utoledo.edu.

University of Toledo Policy Pertaining to Academic Integrity
Academic dishonesty is not tolerated. Among the aims of education are the acquisition of knowledge and the development of skills necessary for success in any profession. Activities inconsistent with these aims are not permitted. Students are responsible for knowing what constitutes academic dishonesty. If students are uncertain about what constitutes plagiarism or cheating they should seek the instructor's advice. Examples of academic dishonesty include, but are not limited to:

- Plagiarizing or representing the words, ideas or information of another person as one's own and not offering proper credit or documentation to the other person;
- Giving or receiving, prior to an examination, any unauthorized information concerning the content of that examination;
- Referring to or displaying any unauthorized materials inside or outside of the examination room during the course of an examination;
- Communicating during an examination in any manner with any unauthorized person concerning the examination or any part of it;
- Giving or receiving substantive aid during the course of an examination;
- Starting an examination before the stipulated time or continuing to work on an examination after the announced conclusion of the examination period;
- Taking, converting, concealing, defacing, damaging or destroying any property related to the preparation or completion of assignments, research, or exams;
- Submitting the same written work to fulfill the requirements for more than one course.

Other Policies
Your safely and well-being as a University of Toledo student is important to the faculty, staff, and administration; as such please take time outside of class to review the code of conduct and non-discrimination policies that apply to you as a student: https://www.utoledo.edu/title-ix/policies.html. You can use this URL to view a more comprehensive list of student policies: https://www.utoledo.edu/policies/audience.html/#students.

ACADEMIC AND SUPPORT SERVICES*
Please follow this link (http://www.utoledo.edu/studentaffairs/departments.html) to view a comprehensive list of Student Academic and Support Services available to you. UT also provides a variety of academic and support services on campus to help you succeed and reach your fullest potential. Whether you need to ask a question, get help with an assignment, seek advice from a counselor, find a job or join a club, UToledo offers some help:

  Tutoring: http://www.utoledo.edu/success/lec/
  Library: http://www.utoledo.edu/library/
  Success Coaching: https://www.utoledo.edu/successcoach/
  Student Affairs: http://www.utoledo.edu/studentaffairs/
  Career Services: http://www.utoledo.edu/success/career/

SAFETY AND HEALTH SERVICES FOR UT STUDENTS*
Please use the following link to view a comprehensive list Campus Health and Safety Services available to you as a student. It covers services related health, mental health, emergencies, and discrimination, among other things. In addition, UT provides assistance via a Food Pantry: http://www.utoledo.edu/studentaffairs/food-pantry/.

HOW TO SUCCEED IN THIS COURSE

Many students fear the statistics requirement for psychology. Some may even wonder why statistics is necessary for psychology majors. Others think back to math courses, which causes anxiety. Even though students may be nervous about taking this class that does not need to be the case. Anxiety can hamper your ability to study and acquire information. Both the TA and I hope to calm any fears about this class and really want to help all of you succeed in this course. We will do our best throughout the semester to do so, and this course should help convince you that it is quite natural for psychology and statistics to work together to further knowledge.

Mastering the basics of statistics is much like learning a new language – it requires practice, practice, practice – and then a bit more practice. New material builds on older material, and it is essential that you stay up to date with the course material. This means studying regularly and completing all assignments on time. Here are some general strategies to use to maximize success when going through the course:

Attend Class. Attending class is critical for success. In fact, research has shown that one of the best predictors of grades in courses is class attendance, and even the brightest students gain more insight by attending classes regularly. This is especially important in a class like statistics, as it is helpful to consume information multiple times and in a number of different formats (e.g., reading, lectures). Moreover, there will be some course material presented in class that does not appear in the book; thus, you will need to attend class to ensure you have all the information covered on exams.

Actively Read, Study, and Take Notes. Research shows that many individuals read and write passively, that is, without thinking about the meaning of what they are covering. When reading and studying textbook-type material, everyone (professors included) must read actively, and as a result somewhat slowly. Research shows that learning is much more effective if you relate new information to old information. Passively transcribing slide content or instructor statements without thinking about it will not help you learn or understand the material. A good approach to reading any type of text is the SQ3R method (https://en.wikipedia.org/wiki/SQ3R). In this approach, start with a **S**urvey of the material to be learned (e.g., all or part of a chapter), and generate preliminary **Q**uestions about the material to guide your reading. Next, **R**ead the material actively and thoughtfully. Once you are done reading, verbally **R**ecite what it is that you have learned. Finally, **R**eview the material again, contrasting it with what you learned, and formulate answers to your initial questions.

Study the Summaries and Section Headings Before and While You Read. Summaries and headings help you mentally organize what you read. The authors did not just throw a bunch of information together randomly; they present an organized framework of ideas and information. You should seek to discover and understand their organization. Research shows that information is learned best when it is part of an organized mental framework.

Alter Your Expectations for Studying. Research consistently shows that students greatly underestimate the effort and time it takes to do a quality job of learning the new and complex material that is part of most courses. Academic experts generally agree that for a typical three-credit semester-long course, spending at least 6 hours per week outside of class working on learning is the norm for reasonable achievement.

Do the Homework Assignments. In order to facilitate your mastery of basic statistics, the course includes 10 homework assignments (in addition to the 4 exams). The purpose of these assignments is two-fold: 1) they allow you more opportunities to earn points in the course, and 2) they give you critical practice for building your understanding of the material to prepare for the exams and to facilitate your use and retention of the information.

Keep up with Class Material and Ask Questions. There is a large amount of information to learn, and new material builds upon previously learned material. Therefore, if you fall behind in the readings or do not understand a key concept, this will hurt your progress in the course. So keep up with the readings and ask questions when things are unclear!

Make Use of Available Resources. Besides what is mentioned above, make use of other resources on and off campus. Use your textbook. In it, complete Appendix A (a basic math self-test and refresher) in the first two weeks

of the semester. Complete all of the "Check Your Learning" sections in the textbook. Review all the "How It Works" sections near the end of each chapter. Complete at least all the odd item Exercises at the end of each chapter (the answers are in Appendix C of the textbook). Also, talk with us during office hours and use online resources (e.g., https://www.youtube.com/user/how2stats/videos; https://www.youtube.com/playlist?list=PL87D6C3431177ED5C; http://www.psychology.emory.edu/clinical/bliwise/Tutorials/). Also make use of campus resources, like tutoring in statistics at the library (http://www.utoledo.edu/success/lec/tutoring/) and online (http://www.utoledo.edu/success/lec/onlinetutoring.html).

COURSE SCHEDULE*
Tentative Course Schedule
(Subject to change based on in-class announcements)

Week	Date	Topic	Reading	Assignment
1	08/27	Introduction: Science and Statistics	Chapter 1	
	08/29	Variables and Measurement		
2	09/03	Data Organization	Chapter 2 & 3	Assignment 1 due
	09/05	Data Organization and SPSS	Chapter 4	
3	09/10	Central Tendency	Chapter 4	
	*09/12**	Variability		Assignment 2 due
4	09/17	Standardized (z) Scores	Chapter 6 (≤ 148)	Assignment 3 due
	09/19	Standardized (z) Scores		
5	09/24	**Exam # 1 (Chapters 1-4 & 6)**		
	09/26	Sampling & Probability	Chapter 5	
6	10/01	Sampling & Probability	Chapter 6 (149+)	
	10/03	Hypothesis Testing Basics	Chapter 7 & 8	Assignment 4 due
7	10/08	Single-sample z-tests		
	10/10	*No class (fall break)*		
8	10/15	t-statistic and Single-sample t-tests	Chapter 9	Assignment 5 due
	10/17	t-statistic and Single-sample t-tests		
9	10/22	Independent Groups t-tests	Chapter 11	Assignment 6 due
	10/24	Correlated Groups t-tests	Chapter 10	
10	10/29	**Exam # 2 (Chapters 5-11)**		
	10/31	Analysis of Variance (ANOVA)	Chapter 12	
11	11/05	Analysis of Variance (ANOVA)		
	11/07	Repeated Measures ANOVA	Chapter 13	Assignment 7 due
12	11/12	Two-Factor ANOVA	Chapter 14	Assignment 8 due
	11/14	**Exam # 3 (Chapters 12-14)**		
13	11/19	Correlation	Chapter 15	
	11/21	Correlation & Regression	Chapter 16	
14	11/26	Chi-square	Chapter 17	Assignment 9 due
	11/28	*No class (Thanksgiving break)*		
15	12/03	Chi Square		
	*12/05**	Choosing the Right Statistic		Assignment 10 due
	12/10	**Exam #4 (final exam)**	**2:45-4:45 pm**	