

**Arizona State University**  
**Hugh Downs School of Human Communication**

SAMPLE Syllabus for:

Communication 608

Multivariate Statistical Analysis of Data in Communication

Fall Semester 2019

6:00 – 8:45 p.m. Tuesdays

Stauffer Hall A417

### Course Description

This course is designed to introduce students to five commonly-used multivariate statistical procedures (i.e., k-way ANOVA, MANOVA, multiple regression, exploratory factor analysis, and structural equation modeling). Class discussion will focus on the nature of each technique, the conditions under which it is appropriate to use each, how to perform these analyses using SPSS (or AMOS), and how to interpret output. In other words, the class will focus on what the statistics *mean* more than mathematical proofs and matrix algebra.

In most cases, statistical analyses will *not* be performed by hand. (In a few unavoidable cases, however, they turn out to be necessary.) In addition, the course will **not** utilize matrix algebra (even though it represents the mathematical underpinnings of our techniques).

Assignments will include: two exams, using SPSS/AMOS to perform statistical analyses, and critiquing published research that employs these methods. Thus, it is important that students have easy access to SPSS (available in STA306, all large computer labs in Tempe [e.g., Coor and the Computer Commons] and other campuses).

Given that the ability to understand multivariate statistics depends on a student's knowledge of univariate statistics, we assume that students have passed, at minimum, a univariate statistics class in the past two years.

### Required Texts

Two textbooks are required for this class:

Meyers, L. S., Gamst, G., & Guarino, A J. (2013). *Applied multivariate research: Design and interpretation* (2<sup>nd</sup> or 3<sup>rd</sup> ed.). Los Angeles, CA: Sage.

Keppel, G., & Wickens, T. D. (2004). *Design and analysis: A researcher's handbook* (4th ed.). Upper Saddle River, NJ: Pearson-Prentice Hall.

Supplementary materials will be provided in class and will be made available on the course Canvas site.

### Requirements: Assignments and Grading

<u>Assignment</u>	<u>Number</u>	<u>Points Each</u>	<u>Total Points</u>
Examinations	2	100	200
Data Analysis	5	50	250
Research Critiques	5	30	<u>150</u>
TOTAL			600

### ***Required Assignments***

Each ***examination*** will cover *approximately* half of the course material. Examinations will be take-home and include both essays and interpretations of statistical outputs. Each exam will be distributed two class sessions before they are due. Students should submit completed exams to the appropriate place in the course Canvas site.

There will be five ***data analysis assignments*** (i.e., one each for k-way ANOVA, MANOVA, multiple regression, exploratory factor analysis, and structural equation modeling). Students will be given data with which to complete each assignment. Each assignment will include a series of hypotheses and/or research questions. Students' task will be to select and perform the appropriate analyses, interpret the output, and write up the results in a 3-5 page, double-spaced, paper using APA-style methods of reporting statistical information. Submit your data analysis assignments to the appropriate place in the course Canvas site.

The ***research critiques*** will cover the same 5 statistical techniques (i.e., k-way ANOVA, MANOVA, multiple regression, exploratory factor analysis, and structural equation modeling). For each procedure, you will be responsible for finding one journal article that employs that procedure and writing a 2-3 page review of that study. Your review should focus on the authors' (or author's) use of the statistical procedure and their interpretation of the results. Additional information concerning this assignment is provided later in the syllabus. Submit your research critiques to the appropriate place in the course Canvas site.

### ***Grading***

There will be 600 points available in this class. The number of points you accumulate throughout the semester will determine your final grade. Final grades will be determined using the following scale.

582.0 – 600.0	= A+	[97% - 100%]
558.0 – 581.9	= A	[93% - 96.9%]
540.0 – 557.9	= A-	[90% - 92.9%]
522.0 – 539.9	= B+	[87% - 89.9%]
498.0 – 521.9	= B	[83% - 86.9%]
480.0 – 497.9	= B-	[80% - 82.9%]
462.0 – 479.9	= C+	[77% - 79.9%]
420.0 – 461.9	= C	[70% - 76.9%]
360.0 – 419.9	= D	[60% - 69.9%]
0.0 – 359.9	= E	[0% - 59.9%]

## Policies

### Attendance

Although no portion of your final grade comes directly from attendance, I consider regular classroom attendance to be an especially important determinant of final grades in this class. Given that material for all assignments will come primarily from lectures (and that lectures will *not* come directly from the textbooks), class attendance is extremely important.

### Incomplete

A mark of "I" (incomplete) is given by the instructor when students who are otherwise doing acceptable work but are unable to complete the course (e.g., final exam or other assignments) because of illness or other conditions beyond the student's control. Students are required to arrange with the instructor for the completion of the course requirements *before the end of the semester*. The arrangement must be recorded on the *Request for Grade of Incomplete* form. Students have one calendar year from the date the mark of "I" is recorded to complete the course. When you complete the course, the instructor must submit an online grade change request. In a graduate course (500-level or above) the "I" grade will become a permanent part of the transcript if the missing material (i.e., assignment[s] or exam) is not completed within one year. After one year, students will have to reregister and pay fees to repeat the course for credit in order to receive a passing grade.

### Academic Dishonesty

Academic dishonesty can take any of several forms. Perhaps the two most likely forms of academic dishonesty in this class are collusion and plagiarism.

*Collusion* occurs when two or more students submit identical assignments (e.g., data analysis assignments). By placing this into my syllabus, I do not want to eliminate study groups. (In graduate courses such as this one, study groups are frequently a very good idea.) What I want to avoid is for one person to do the work and for more than one person to submit it. It is fine to work and study together, but when it comes time to complete your assignment, work independently.

*Plagiarism* is using someone else's words or ideas without proper credit being given to that source. Instructors assume a paper to be in the student's own words and to represent his or her original ideas, unless s/he properly credits certain words and ideas to a proper authority. A paper bearing a student's name that does not do this is plagiarized and represents academic dishonesty.

Plagiarism can also occur in many forms. Word-for-word copying of another work without the use of quotation marks or citing that source, paraphrasing another person's ideas without proper citation of that work, providing a misleading citation, and handing in all or part of another student's work (e.g., a paper from a previous year) are all considered plagiarism. Whether the material comes from the Internet, another student's work from a previous year, or a student's own work from another class, it would still represent plagiarism.

**Title IX Statement.** Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <http://sexualviolenceprevention.asu.edu/faqs/students>.

*As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, <https://eoss.asu.edu/counseling>, is available if you wish discuss any concerns confidentially and privately.*

## COM608 – Fall Semester 2019 – Tentative Semester Schedule [REVISED]

Week	Date	Topic	Keppel & Wickens Readings	Meyers et al. Readings	Assignments Due
1	August 27	Course Introduction Multivariate Techniques and Assumptions	Ch. 1, 7	All: Ch. 1, 2;	
2	September 3	Data Screening and k-way ANOVA	Ch. 10-11	2 <sup>nd</sup> : Ch. 3, 4A/B; 3 <sup>rd</sup> : Ch. 3, Canvas	
3	9/10	k-way ANOVA			
4	9/17	MANOVA	Ch. 21	2 <sup>nd</sup> : Ch. 5A/B 3 <sup>rd</sup> : 18A/B	ANOVA Critique
5	9/24	Repeated Measures [M]ANOVA and [M]ANCOVA	Ch. 15-17 (-p. 380)		ANOVA Assignment
6	October 1	Multiple Regression		2 <sup>nd</sup> : Ch. 7A/B 3 <sup>rd</sup> : Ch. 5A/B	Midterm Exam Distributed MANOVA Critique
7	10/8	Multiple Regression		2 <sup>nd</sup> : Ch. 8 A/B 3 <sup>rd</sup> : Ch. 6 A/B	MANOVA Assignment
---	10/15	<b>NO CLASS: Fall Break</b>			Midterm Exam Due
8	10/22	Multiple Regression		2 <sup>nd</sup> : Ch. 12A/B 3 <sup>rd</sup> : Ch. 10 A/B	Multiple Regression. Critique
9	10/29	Exploratory Factor Analysis [EFA]		<b>Canvas:</b> Costello & Osborn (2005)	Multiple Regression Assignment
10	November 5	Exploratory Factor Analysis [EFA]		2 <sup>nd</sup> : Ch. 16A/B 3 <sup>rd</sup> : Ch. 11 A/B	
11	11/12	SEM: Confirmatory Factor Analysis [CFA]		2 <sup>nd</sup> : Ch. 17A/B 3 <sup>rd</sup> : Ch. 12 A/B	EFA Critique
12	11/19	SEM: Path Analysis			EFA Assignment
13	11/26	SEM on AMOS			Final Exam Distributed SEM Critique
14	December 3	Data Workshop			SEM Assignment
<b>Final Exam Due: Tuesday, December 10th</b>					

## Article Critique Assignment

This assignment will acquaint you with the use (and, perhaps, misuse and abuse) of our five statistical procedures in published Communication research (or your home discipline). For each procedure (k-way ANOVA, MANOVA, Multiple Regression, Exploratory Factor Analysis, and Structural Equation Modeling), your task is to find one piece of published research using that procedure and write a summary of the article. For Communication students, the following journals represent the *types* of outlets I would expect to see represented in this assignment. (If you want to use a different journal, particularly if you are not a Communication student, feel free check with me):

<i>Human Communication Research</i>	<i>Journal of Social and Personal Relationships</i>
<i>Communication Monographs</i>	<i>Journal of Personality and Social Psychology</i>
<i>Journal of Communication</i>	<i>Personal Relationships</i>
<i>Western Journal of Communication</i>	<i>Communication Quarterly</i>
<i>Communication Research</i>	<i>Southern Journal of Communication</i>
<i>[Journal of] Health Communication</i>	<i>Management Communication Quarterly</i>

After locating your article, write a 2-3 page summary consistent with the following outline:

1. Give the citation of the article in proper APA (6<sup>th</sup> edition) format.
2. One-paragraph introduction to the study (what is it about?)
3. Summary of the hypotheses tested with the statistic under consideration. (When performing the multiple regression assignment, for instance, you do not need to summarize hypotheses not tested with regression). If there are a large number of hypotheses all tested with the statistic under consideration, you can choose a subset to discuss. In the case of factor analysis, if it is not used to test hypotheses, describe the purpose of the analyses.
4. Describe, in detail, how the authors' performed the procedure. Specifically, describe:
  - a. What were the independent/predictor and dependent/criterion variables (or, in factor analysis, what were the items and/or variables being analyzed)?
  - b. What steps were taken to determine whether the statistic's assumptions were met? Were they met? If assumptions were violated, what corrective actions were taken? If such steps are not described, what are the potential ramifications of violating assumptions?
  - c. Describe the tests performed. For instance, was a MANOVA within-subjects, between-subjects, or mixed? Was it a saturated or reduced model? Were there covariates? Was a regression performed in a forward, backward, or stepwise manner? Was a factor analysis principal components or principal axis? Were factors rotated? Which rotation was used? Was the rotation orthogonal or oblique? **Look for, and describe, all the information you would need to run the test in precisely the same way.**
5. Provide the statistical result(s) of the test(s), in proper APA-style format. In the case of factor analysis, describe how many factors analyses produced, what each factor consisted of, and the internal reliability (e.g., coefficient alpha) of each factor.
6. Based on your understanding of the procedure, provide a critique of the author's use of that procedure. Was it the appropriate procedure to use given the research question/hypothesis and the data at hand? Did the authors adequately test, and correct, for violations of assumptions? If not, what *should* they have done? Did

the authors interpret results correctly? Most important, what might have affected the results (other than the actual effect being tested)? If the results were non-significant, what might have accounted for that? If the results were significant, are they robust? Could results have been inflated or attenuated by something in the design or in the statistical test?

As you read your article (and develop your critique), remember that just because a study is published (even in a high-quality journal), that does not mean it is without flaws (or even particularly good). The quality of statistical analyses and interpretation will vary across authors, studies, journals, and journal editors. So, dig in and try to determine what was done correctly and what was not. Keep in mind that much of the information you are looking for (e.g., tests of assumptions) may not be reported. Omission does not mean that the tests were not performed; often the journal's space restrictions prevent such information from being reported in detail. In your critique, therefore, note that such information was missing.

7. Attach a copy of the article's title page.



## **MONGEAU'S GENERAL CRITERIA FOR EVALUATING PAPERS**

In my academic experience, some criteria that I use in evaluating written assignments (e.g., course papers, journal submissions, and my own writing) are specific to the particular assignment or task at hand. On the other hand, while the specific *content* of the various papers differ, several *general criteria* that I use to evaluate them remain pretty much the same. I want to spend a bit of time here discussing these general criteria. These criteria are not mutually exclusive (e.g., a lack of organization influences perceptions of clarity); however, I hope that this gives you a good idea of what yardsticks I use when I grade papers. I generally use five general criteria in evaluating student papers.

### CRITERION 1: CLARITY

The primary criterion that I use when I evaluate a paper (a draft of my own work, a manuscript that I receive as a reviewer for a professional journal, or a graduate student's paper) is *clarity*. Simply put, are you communicating whatever it is that you are trying to say unambiguously? It does not matter if you are trying to describe a relationship that you have been part of, reviewing a theoretical literature on relationship initiation, or describing the use of a multivariate statistical technique, you must do so *clearly*. Saying something simply is better than saying something using complex, convoluted, language. Do not feel as though you have to use a lot of technical jargon because the research you have read does it. If I consistently cannot understand what you are trying to say, your grade is going to suffer as a result.

### CRITERION 2: COMPLETENESS

I evaluate completeness on two levels. First, I evaluate completeness on a *macro* level. Most of my paper assignment includes multiple parts. For example, a reaction/application paper requires that you first describe course material and then either apply that material to your life experiences or describe how and why you reacted the way that you did. When I evaluate completeness on the macro level, I am looking for the extent to which you actually perform each of the tasks that I require. Failure to complete a major part of a paper is a serious error that will result in substantial point deductions. Therefore, it is important that I know what you are doing as you work your way through your paper. It is in your best interest to inform me where you are and what you are doing in your paper. Signposting and transitions between parts helps immensely in keeping me informed as to what you are doing in your paper.

I also evaluate completeness on a *micro* level. Completeness on a micro level represents the extent to which you adequately tackle *each of the tasks* required in the paper. The question here is how well did you perform each of the tasks required? How completely you should describe something, of course, depends on the nature and length of your paper. If you are describing Predicted Outcome Value Theory in a relationship paper, it does not make sense to spend five pages of your seven-page paper describing the theory. You need to complete all parts of the assignment given the page restrictions.

### CRITERION 3: ORGANIZATION

The third criterion I use in evaluating papers is organization. Your ideas should develop in a logical manner. Words should fit together to form phrases. Phrases should fit together to form sentences. Sentences should fit together to make paragraphs. Paragraphs should fit together to form the major sections of your paper. What I do

not want is a paper that rambles from point to point without any connection between them. The paper assignments suggest a particular organizational scheme for the major parts of your papers and I *strongly* suggest that you stick to them. Within major sections, however, the choice of an organizational scheme is up to you.

#### CRITERION 4: VALIDITY

The fourth major criterion I use in grading papers has to do with the validity of the presented arguments. The arguments that you make in your papers must be valid. This means that the conclusions of your arguments must follow from the premises. Further, the premises and conclusions that you draw should be explicit. I should not have to dig through a paper to identify and understand the arguments you are trying to make.

Part of the validity of an argument has to do with the data supporting a particular conclusion. Specifically, properly document all statements of fact from a reputable primary source. For example, if you are making the claim that men and women communicate differently in some important ways, you need to support that conclusion (or claim) with a reference from a reputable and primary source.

#### CRITERION 5: MECHANICS

My evaluation also focuses on the technical (or stylistic) aspects of the paper. I expect that submitted drafts should be devoid of grammatical errors, typographical errors, misspellings, punctuation errors, sentence fragments, and so on. In this respect, it would be helpful to develop the habit of completing rough drafts of your work and then spending time cleaning and polishing your writing. If you try to write the entire paper the last day or two before it is due, you will almost certainly encounter stylistic problems, not to mention substantive ones.

I will also evaluate the format of source citations and references provided (if any). The format of the paper, source citations, and reference lists, tables, and statistical information must be consistent with the sixth edition of the *Publication Manual of the American Psychological Association*.