Advanced Quantitative Research Method for Information Science

INFO 6020

Course Syllabus

Instructor

Dr. Jeff M. Allen
Regents Professor of Information Science
University of North Texas
https://sageprofessor.com/contact/

Teaching Assistant

Malak Kadar
Doctoral Candidate

Course Format

On-campus course at Discovery Park Campus (16 Modules)

Location

Contact Instructor (changes each semester)

Course Communication

Communications are best immediately before, immediately after, or during the course meeting times. Dr. Allen has additional advising time that will be discussed during the first-class meeting.

For other communication please:

Use the INBOX tab on the left menu tab in Canvas to compose your email messages to the Teaching Assistant and/or Professor

DO NOT use @unt.edu email to contact instructors. Your email for the course will be lost in the many other emails.

The first contact for course questions will typically be the course teaching assistant. The Teaching Assistant for the course and will be able to assist you with 90% of questions and issues. For the other 10% contact Dr. Allen first. The teaching assistant is utilized for this course to provide additional help as you complete the assignments.

Though responses may be slightly different, they will be close - many times it's due to an interpretation of the question(s).
Course Prerequisite

If you do not have the appropriate prerequisite course, you should drop the course. This is an equivalency chart for prerequisites and this course. All other substitutions must be approved by the instructor of the course.

<table>
<thead>
<tr>
<th>Course</th>
<th>Equivalency</th>
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</thead>
<tbody>
<tr>
<td>INFO 6940 Seminar in Research and Research Methodology or equivalent</td>
<td>none</td>
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<tr>
<td>INFO 6010* Quantitative Research Methods in Information Science</td>
<td>EPSY 6010, ADTA 5130, CSCE 5310</td>
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<tr>
<td>*Prerequisite: INFO 6940 Research Design</td>
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<tr>
<td>INFO 6020* Advanced Quantitative Research Methods in Information Science</td>
<td>EPSY 6020 ADTA 5230, CSCE 5380</td>
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<tr>
<td>*Prerequisite: INFO 6050 Quantitative Research Methods in Information Science or equivalent.</td>
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</tbody>
</table>

Course Format

An on-campus course at UNT Discovery Park Campus (16 Modules)

Course Location:

NTDP D207A

Course Description

This is the second course in a two-course sequence on quantitative research methods (INFO 6010, INFO 6020) in Information Science. This course will introduce information science scholars to advanced concepts and techniques in quantitative research in preparation for conducting independent research.

The goal of the two-course sequence is to teach you to understand and to confidently apply a variety of statistical methods and research designs that are essential for information science research.

Extended Description

This quantitative course series will not teach you data-analysis and interpretation – there is simply not enough hand-on time in a two-course series. Rather it will introduce you to the tools and the application of those tools. It is an expectation that further study will be necessary to become an expert in the research, statistical and measurement techniques in your field of study. This comes with both education and professional practice.

Course Goals and Objectives

The primary goal of this course is to equip doctoral students with the conceptual knowledge to be a consumer, and creator, of scholarly research and the practical skills to apply this knowledge while pursuing their own research goals.

By the end of the semester, students should be able to:
1. Demonstrate their knowledge of the advanced of inferential statistics by making valid generalizations and choosing appropriate analysis techniques from sample data.
2. Demonstrate an understanding of the concepts and techniques in advanced quantitative research in preparation for conducting independent research.
3. Demonstrate an understanding of advanced statistical techniques appropriate to conducting doctoral-level research in information science.

**Required Materials**


ISBN-10: 1433805626

Note: Spiral bound version is recommended


ISBN-10: 013217863X

**Suggested Text**


**Course Philosophy**

As a doctoral level course, it is significantly different from an undergraduate or master level course. Students are expected to contribute to discussions and to spend a significant period outside of class gather knowledge that can be contributed to the knowledge of their fellow students. Attendance is a very important component in a seminar class and is expected of all students.

Learning quantitative statistical analyses is similar to learning a new language. There are often words that are hard to pronounce, difficult to remember, and may have similar meanings. However, by continually practicing the new language through observation, reading, and writing, learners have the opportunity to pick up the language quickly and sound like a native speaker. Therefore, this course has Modulely assignments to give learners the opportunity to regularly practice the new language of quantitative statistical analyses. Learners will be expected to work individually and in teams to facilitate both individual and peer learning. To facilitate a safe learning environment, learners will have opportunities to build from their mistakes as they practice the new language through a variety of means.

**Grading Philosophy**

The process of receiving grades can inhibit the learning process. We endeavor to create a safe learning environment. As part of that environment, you have every opportunity to maintain a high grade in the course.
Course Attendance

*Attendance in this course is essential, expected and required.* Every absence from a full semester course (10 to 16 sessions) may lower the student’s final course grade by ½ letter grade.

If there are 10 or less sessions during the semester, each absence may lower the student’s final course grade by a one full letter grade. If a student is penalized for a total of 1 ½ letter grades, the instructor may request of the Registrar that a student be dropped from the course (W or WF).

While we understand that there are valid reasons for missing a class session, we need your participation in the course discussions. Please take the above very seriously and plan your semester schedule accordingly.

Please see the UNT “Student Attendance and Authorized Absences” document for policy information.

Notes for this semester

This course was recently reconceptualized and reorganized. You are the third set of students to work in this new format. There still some growing pains and a few errors. Please provide feedback to Dr. Allen ([Jeff.Allen@unt.edu](mailto:Jeff.Allen@unt.edu)) so that we can continue to improve the quality of the course.

Course Evaluation

- A = 90 – 100%
- B = 80 – 89%
- C = 70 – 79%
- D = 60 – 69%
- F = 59% or below

Assignment 1 – 5 75% of final grade
Assignment 6 25% of final grade

VERY IMPORTANT EVALUATION NOTES

1. **Assignments are due by 5:00p central time (GMT -6) on the date listed in the course calendar.**

2. **All Late Assignment will receive a letter grade of “F”.** Missing deadlines is not a business practice that allows employees to earn a living – for very long.

3. **There are VERY, VERY few exceptions made to assignment deadlines – all assignments and due dates are known well in advance of the assignment deadline.**

4. **PLEASE turn assignment in early – this is a viable and recommended practice.**
## Course Calendar

<table>
<thead>
<tr>
<th>Module</th>
<th>Module Notes</th>
<th>Huck Readings</th>
<th>Assignments</th>
<th>% of Final Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module 1</strong></td>
<td>Review (INFO 6010) &amp; Orientation</td>
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<tr>
<td><strong>Module 2</strong></td>
<td>Missing Data</td>
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<td><strong>Module 3</strong></td>
<td>Bivariate, Multiple, and Logistic Regression</td>
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<td>Assign 1</td>
<td>10%</td>
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<tr>
<td></td>
<td>• Multiple Regression</td>
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<td></td>
<td>• Mediation and Moderation</td>
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<tr>
<td></td>
<td>• Logistic Regression</td>
<td>Chapter 16</td>
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<tr>
<td><strong>Module 4</strong></td>
<td>Inferences on Percentages, Proportion, and Frequencies</td>
<td></td>
<td>Assign 2</td>
<td>10%</td>
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<td></td>
<td>• The Sign, Binomial, and Fisher’s Exact tests</td>
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<td></td>
<td>• Chi-squares tests (May be broken down into different videos)</td>
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<td></td>
<td>• Z-tests</td>
<td>Chapter 17</td>
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<tr>
<td><strong>Module 5</strong></td>
<td>Statistical Tests on Ranks (Nonparametric Tests)</td>
<td></td>
<td>Assign 3</td>
<td>10%</td>
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<td></td>
<td>• The median test</td>
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<td></td>
<td>• Mann–Whitney U test</td>
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<td></td>
<td>• The Kruskal–Wallis H Test</td>
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<td></td>
<td>• The Wilcoxon Matched-Pairs Signed-Ranks Test</td>
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<td></td>
<td>• Friedman’s Two-Way Analysis of Variance of Ranks</td>
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<td></td>
<td>Chapter 18</td>
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<tr>
<td><strong>Module 6</strong></td>
<td>Multivariate Tests on Means</td>
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<td>Assign 4</td>
<td>10%</td>
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<tr>
<td></td>
<td>• Checking the Assumptions before conducting a MANOVA test</td>
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<tr>
<td></td>
<td>• MANOVA</td>
<td>Chapter 19</td>
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</table>
### Module 7

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
<th>Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor Analysis</td>
<td>- Exploratory Factor Analysis (EFA)</td>
<td>20</td>
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</tbody>
</table>

### Module 8

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
<th>Chapter</th>
</tr>
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<tbody>
<tr>
<td>Factor Analysis (Continued)</td>
<td>- Confirmatory Factor Analysis (CFA)</td>
<td>20</td>
</tr>
</tbody>
</table>
| Structural Equation Modeling | - Measurement Model and Structural Model  
- Modification Indices, model interpretation and fit statistics  
- Using SEM to Comparing Group Means | 21 |
| Structural Equation Modeling (Part 2) | - Using SEM to Comparing Group Means | 21 | Assign 6 | 10% |
| Course Review | | | Final Presentations | 10% |
| Final Project Due | | | Final Project | 20% |

Note. The course schedule may be adapted during the semester to meet learner needs.

**Course Assignment Appeals**

If you have received an individual assignment grade that you disagree with, please contact the course TA with written grade appeal within seven days of the grade posting. To parallel course grade appeals, an assignment appeal is appropriate when the student believes that the “the grade was awarded in an inequitable, arbitrary, or erroneous manner. Appropriate grounds for appeal include circumstances where the grade was assigned based on a. inequitable treatment that is the result of departure from the instructor’s stated standards, and course policies; or b. a decision based on an error in fact.”
General UNT Information

Note: Links have been provided to seek further information from UNT resources

Classroom Disability Accommodations

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time, however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information see the Office of Disability Accommodation website at http://www.unt.edu/oda.

Disability Accommodations

The following is from https://disability.unt.edu/. I have included some appropriate portions to help you seek guidance. You have to start the process:

"Student and Office of Disability Accommodation Responsibilities

The Office of Disability Accommodation (ODA) is responsible for verifying that a student has a disability (as defined by the ADA). In order to receive a reasonable accommodation, a student must have a physical or mental impairment that substantially limits a major life activity (including the major life activity of learning), be perceived as disabled, or have a record of a disability. Because not all physical or mental impairments are considered disabilities under the ADA, including those that present themselves in noticeable fashion (e.g. wearing eyeglasses), it is important for faculty members to direct students to the ODA for verification of disabilities when a student seeks a reasonable accommodation. Once the ODA establishes that a student is disabled, the instructor/department, in consultation with appropriate departments (i.e. legal and ODA), determines whether a reasonable accommodation can be made that does not alter the fundamental requirements of a particular course or program.

Reasonable Accommodation Not Retroactive

Syllabi should inform students that they must go through the ODA before receiving a reasonable accommodation for a course and that they should have any disability for which they want a reasonable accommodation verified before a specified class day. Failure to obtain verification by the date established by the faculty member does not mean the student can never receive a reasonable accommodation in the course.
However, the faculty member only has to provide a reasonable accommodation once the disability is verified (assuming reasonable accommodation is possible). Grades received prior to verification of a disability and implementation of a reasonable accommodation need not be changed.

No Obligation to Identify Disability

A faculty member is not legally obligated to identify or diagnose a disability. Even if the disability is readily apparent and the student is having difficulty in the course, a faculty member should not ask the student whether his/her disability or condition is causing the academic difficulty. Instead, have a list of resources ready as you would for all students experiencing academic difficulty and include the ODA in that list.

Temporary Impairments

Faculty members are not required to modify course requirements if a student is experiencing a temporary physical or mental impairment. The ODA will take into consideration the duration of the impairment when determining whether the student is disabled as defined by the ADA. However, an instructor may offer adjustments for students with temporary impairments (e.g. broken arm).

Letter Confirming Disability

The ODA will give a student a letter confirming he/she is disabled. This letter will recommend reasonable accommodations that the instructor should consider making.

University Policy of Honesty and Integrity

https://policy.unt.edu/sites/default/files/06.003.pdf (Links to an external site.)

Course Grade Appeal

https://policy.unt.edu/policy/06-040 (Links to an external site.)