



**Advanced Multivariate Statistics**

**NURS 6324.060**

**Fall 2023**

**Scheduled Class Days and Times: Online**

**Instructor's Name: Kevin Gosselin, Ph.D.**

**Office:** Virtual

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**Office Hours:** Virtual held each Wednesday from 11:00 AM to 2:00 PM CST via Zoom and by appointment. Email Dr. Gosselin to schedule a Zoom meeting.

**Course Description:** Students will study advanced multivariate techniques in health care research and apply aspects of complex research designs and advanced statistical techniques including logistic regression, multiple analysis of variance, and factor analysis.

**Prerequisites:** NURS 6322

**Student Learning Outcomes:**

Upon completion of this course, you should demonstrate knowledge and/or skills in the following statistical techniques including:

- 1) Logistic regression
- 2) Multivariate analysis of variance (MANOVA) and discriminant analysis.
- 3) Survey development and validation including content validity index (CVI) determination, latent variable techniques including exploratory factor analysis (EFA), principal component analyses (PCA) and an introduction to the confirmatory factor analysis (CFA).
- 4) Testing assumptions of the multivariate statistical tests.
- 5) Using statistical software, e.g., IBM SPSS and G\*Power.
- 6) Reporting and interpreting statistical results and findings.
- 7) Critiquing healthcare research using advanced statistical methods. Assessment Methods will include use of quizzes, assignments and discussion board responses.

**Required Textbooks and Readings:**

Field, A. (2017). *Discovering statistics using IBM SPSS: North American edition*, 5th edition. Thousand Oaks, CA: Sage. Publications.

Pallant, J. (2020) *SPSS Survival Manual*, 7th edition. New York: McGraw Hill Education ISBN-10: 0335249493

Publication manual of the American Psychological Association (7th ed). APA. ISBN-13: 978-1-4338-3216-1.

**Materials:**

This course requires you to use IBM SPSS v.28. Licenses can be purchased or renewed through the following link: <https://onthehub.com/spss>

External Websites: a document of external website references is provided within the Canvas course.

**Assignments and Weights/Percentage/Point Values**

1. Participation and Discussion Boards	15%
2. Quizzes	15%
3. Article Critique	10%
4. Assignment 1 – Logistic Regression	20%
5. Assignment 1 – MANOVA	20%
6. Assignment 2 – Survey Science: EFA/PCA/CFA	20%
Total	100%

**Grading Scale:**

Specific guidelines and grading criteria for all assignments are in the Modules. Final grades for the course will be determined based upon the following point assignments:

A - 90-100

B - 80-89

C - 70-79

D - 60-69

F - Below 60

Grades will not be rounded when calculating the average (79.5 is not rounded to 80, and 89.5 is not rounded to 90). Students are required to achieve an average of 80% (B) to complete the course successfully.

**Exam and homework materials, questions, and problems are the intellectual property of faculty, UT Tyler, or publishers.**

- These materials may not be distributed without permission.

- Distributing or uploading them to online resources destroys the integrity of the assignment and the course, allowing others an unfair advantage by letting them view the materials.
- Uploading these materials to online resources is a violation of UT Tyler's academic misconduct policies and may result in formal conduct charges.
- Sanctions for uploading or otherwise divulging the contents of these materials can include:
  - a reduced or failing grade on an assignment
  - a reduced or failing grade for the course
  - removal from the Nursing program
  - removal from UT Tyler

**Late Policy:** 5% will be deducted each day an assignment is past due unless prior arrangements have been made with your course faculty. Extenuating circumstances may apply.

**Repeating a Course:** Students repeating this course may not use previously submitted assignments nor utilize the same patients for an assignment. Submitting the same or slightly modified assignments from previous semesters is considered self-plagiarism and is subject to academic discipline, including failing the assignment or the course.

**Attendance and Make-up Policy:** Attendance/participation is expected. Make-up for exams, quizzes, assignments, and missed clinical time is at the instructor's discretion.

### **Graded Course Requirements Information:**

**Participation and Discussion Boards:** This is an opportunity to reflect on the course readings, discuss content with students and faculty, and demonstrate understanding of the course material (15% of your grade).

A Rubric for how postings will be graded is provided in the next section of this Syllabus.

- Each participant is responsible for participating in the asynchronous discussions of each assigned module. This participation will include posting answers to questions posed by the instructor and replying to other participants' postings.
- Discussion postings should be made in a timely manner. Deadlines are listed in the Course Schedule. Please note that all discussion postings must be completed by midnight Central Standard Time on the due date.
- Participants should plan on entering the Discussion area several times a week to read and comment on other postings. Posting answers to the questions posed in the Discussion area should be done in advance of the deadline to allow other participants to have the opportunity to comment.
- Quality of answers is as important as quantity. A participant's comments should add to the discussion. Comments should be supported as required with references cited appropriately. The instructors and/or participants may use synchronous chats as the need arises.

The purpose of the discussion board in an online doctoral program is to take the place of the class interchange that would occur in a face-to-face class. We will expect you to share ideas you have gained from the literature, noting the source when appropriate and interpreting into your own words.

The following information will give you some guidelines and allow you to see the thinking process used to evaluate the discussion board exercises.

Criteria	<79	80-89	90-100
Format and logical progression of posting.	Spelling and grammar errors detract from the substance of the posting; random thoughts with no sense of a plan to reach a logical conclusion. No clear main idea or direction for flow of information	Midpoint	Form is superior; obvious attention to proofreading and grammar. Main idea is stated early and clearly; argument or ideas are built using a logical progression of thoughts which are stated clearly and succinctly.
Depth and relevance of post to the topic at hand.	Posting shows superficial thinking based on personal experiences or opinions only, there is little consideration of contributions to the topic in the literature or from colleagues. Literature support is not relevant to the topic or major literature contributions are missing. Post strays from topic with much irrelevant information and does not address the intent of the assignment. No references cited.	Midpoint	Posting clearly shows evidence of critical thinking and analysis to a substantial depth expected of a doctoral student. Ideas offered are relevant to the topic and show the ability to extrapolate complex ideas from various sources into a coherent argument or statement(s). Two or more relevant references cited; cited references are appropriate and indicative of the best knowledge on the topic.
Contribution to the learning community	Posting is largely aimed at self-expression without consideration of the reader. There is no room for dialogue or disagreement and no acknowledgment of the potential contributions of others. The posting is a rehash of old ideas without consideration of how these can advise the future. No evidence is found of making the material consumable or reader-friendly.	Midpoint	Posting shows an astute awareness of the needs of the learning community with an interest in their growth and knowledge acquisition; attempts to move colleagues into meaningful dialogue and presents creative approaches that area open to discussion. Post contributes to the progression of nursing as a scholarly community but is presented in a clear, enlightening, and engaging way.

**Quizzes:** Quizzes may be taken twice within the due date on the calendar and the two scores will be averaged (15% of your grade).

**Article Critique:** This assignment is an opportunity for you to apply your knowledge by providing peer-review and critical evaluation of research. Details on the assignment will be provided in class (10% of your grade).

**Assignment 1 (Logistic Regression):** This assignment allows you to take your understanding of logistic regression through submission of an output file with the analysis and write up of the results in APA format. Additional information will be provided in class (20% of your grade).

**Assignment 2 (Multiple Analysis of Variance):** This assignment allows you to take your understanding of Multiple Analysis of Variance (MANOVA) through submission of an output file

with the analysis and write up of the results in APA format. Additional information will be provided in class (20% of your grade).

***Assignment 3 (Exploratory Factor Analysis and Principal Component Analysis):*** This assignment allows you to take your understanding of initial survey validation using Exploratory Factor Analysis (EFA) or Principal Component Analysis (PCA) through submission of an output file with the analysis and write up of the results in APA format. Additional information will be provided in class (20% of your grade).

**Calendar of Topics, Readings, and Due Dates:**

<b>Course Schedule</b>				
<i>Week #</i>	<i>Date</i>	<i>Class Topic</i>	<i>Readings</i>	<i>Assignments Due</i>
Intro Week	Thr 8/24	Review of course		
Week 1	M 8/28	Intro to NURS 6324 - Syllabus - Course Calendar - Assignments Overview	Syllabus	Discussion Board #1 (course introductions)  <b>Sep. 6 – Census date</b>
Week 2	M 9/4	<b>Labor Day, no class (Sep. 4)</b>  Review of simple and multiple regression  Sample size determination for multivariate analysis	Pallant Chapter 4 Video (Dr. Gosselin)	Discussion Board #2 (sample size determination)
Week 3	M 9/11	Logistic Regression  Data Extraction, Merging, and Transformation Review & Application for Course Assignments	Field Chapter 20 Pallant Chapter 14	Discussion Board #3 (logistic regression)
Week 4	M 9/18	Applications and Translation of Logistic Regression Findings	Selected Articles Video (Dr. Gosselin)	LR Assignment 1
Week 5 & 6	09/25 10/02	Evaluating the Research Literature	Selected Methods Research Articles	Article Critique
Week 7 & 8	10/9 10/16	Multivariate Analysis of Variance (MANOVA)	Field Chapter 17 Pallant Chapter 21	Quiz 1

				MANOVA Assignment 2
Week 9	M 10/23	Introduction to Survey Science and CVI	Selected Articles	Participation/DB #4 CVI Questions
Week 10	M 10/30	Content Validity Index	Video (Dr. Gosselin)	Participation/DB #5 CVI Results
Week 11 & 12	M 11/6 M 11/13	Exploratory Factor Analysis and Principal Component Analysis	Field Chapter 18 Pallant Chapter 15	Quiz 2  <b>Nov. 4 – last day to drop with W</b>
Week 13	11/20	<b>Thanksgiving Holidays: No Classes</b>		
Week 14	M 11/27	Confirmatory Factor Analysis & Course Summation	Select Articles and Video	EFA/PCA Assignment 3

Weeks start on Monday and end the following Sunday. Assignments due on the designated Friday of the corresponding week by 4:00 PM CT. For rows with multiple weeks, the due date is the last week listed (For example, for weeks 5 & 6 running Monday (09/25) through Sunday (10/22), the “Article Critique” assignment would be due by 4:00 PM CT on Friday (10/20). Discussion Board forums run on a regular calendar week (start on Mondays at 8:00 AM CT and end the following Sunday with due dates at 11:59 PM CT).

#### School of Nursing Policies and Additional Information:

[https://www.utt Tyler.edu/nursing/college/student\\_guide\\_and\\_policies.php](https://www.utt Tyler.edu/nursing/college/student_guide_and_policies.php)

#### Student Resources to assist you in this course:

[UT Tyler Student Accessibility and Resource \(SAR\) Office](#) (provides needed accommodations to students with document needs related to access and learning)

[UT Tyler Writing Center](#)

[The Mathematics Learning Center](#)

[UT Tyler PASS Tutoring Center](#)

[UT Tyler Supplemental Instruction](#)

[Robert Muntz Library](#) and [Library Liaison](#)

[Canvas 101](#) (learn to use Canvas, proctoring, Unicheck, and other software)

Digital Support Toolkit (for supported courses only. Students are automatically enrolled in the toolkit for supported courses)

LIB 422 -- Computer Lab where students can take a proctored exam

[The Career Success Center](#)

[UT Tyler Testing Center](#)

[Office of Research & Scholarship Design and Data Analysis Lab](#)

### **Resources available to UT Tyler Students**

[UT Tyler Counseling Center](#) (available to all students)

[TAO Online Support Center](#) (online self-help modules related to mental & emotional health)

[Military and Veterans Success Center](#) (support for all of our military-affiliated students)

[UT Tyler Patriot Food Pantry](#)

[UT Tyler Financial Aid and Scholarships](#)

[UT Tyler Registrar's Office](#)

[Office of International Programs](#)

[Title IX Reporting](#)

[Patriots Engage](#) (available to all students. Get engaged at UT Tyler.)

### **University Policies and Information**

**Withdrawing from Class:** Students, you are allowed to [withdraw](#) (drop) from this course through the University's Withdrawal Portal. Texas law prohibits students who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at other 2-year or 4-year Texas public colleges and universities. Make sure to consider the impact withdrawing from this class has on your academic progress as well as the financial implications. We encourage you to consult your advisor(s) and financial aid for additional guidance. CAUTION #1: Withdrawing before census day does not mean you get a full refund. Please see the [Tuition and Fee Refund Schedule](#). CAUTION #2: All international students must check with the [Office of International Programs](#) before withdrawing. All international students are required to enroll full-time for fall and spring terms.

**Final Exam Policy:** Final examinations are administered as scheduled. If unusual circumstances require that special arrangements be made for an individual student or class, the dean of the appropriate college, after consultation with the faculty member involved, may authorize an exception to the schedule. Faculty members are required to maintain student final examination papers for a minimum of three months following the examination date.

**Incomplete Grade Policy:** If a student, because of extenuating circumstances, is unable to complete all of the requirements for a course by the end of the semester, then the instructor may recommend an Incomplete (I) for the course. The "I" may be assigned in lieu of a grade only when all of the following conditions are met: (a) the student has been making satisfactory progress in the course; (b) the student is unable to complete all course work or final exam due to unusual circumstances that are beyond personal control and are acceptable to the instructor, and (c) the student presents these reasons prior to the time that the final grade roster is due. The semester credit hours for an Incomplete will not be used to calculate the grade point average for a student.

The student and the instructor must submit an Incomplete Form detailing the work required and the time by which the work must be completed to their respective department chair or college dean for approval. The time limit established must not exceed one year. Should the student fail to complete all of the work for the course within the time limit, then the instructor may assign zeros to the unfinished work, compute the course average for the student, and assign the appropriate grade. If a grade has not been assigned within one year, then the Incomplete will be changed to an F or NC if the course was originally taken under the CR/NC grading basis.

**Grade Appeal Policy:** UT Tyler's Grade Appeal policy requires the completion of a Grade Appeal form for this action to take place. The grade appeal begins with the instructor of your course. If you do not agree with the decision of the instructor, you may then move your appeal to the department chair/school director for that course. If you are still dissatisfied with the decision of the chair/director, you may move the appeal to the dean of the college offering that course, who has the final decision. Grade appeals must be initiated within sixty (60) days from the date of receiving the final course grade. The grade Appeal form is found on the [Registrar's Form Library](#).

**Disability/Accessibility Services:** The University of Texas at Tyler has a continuing commitment to providing reasonable accommodations for students with documented disabilities. Students with disabilities who may need accommodation(s) in order to fully participate in this class are urged to contact the Student Accessibility and Resources Office (SAR) as soon as possible to explore what arrangements need to be made to ensure access. If you have a disability, you are encouraged to visit the SAR Portal (<https://hood.accessiblelearning.com/UTTyler/>) and complete the New Student Application. For more information, please visit the [SAR webpage](#) or call 903.566.7079.

**Military Affiliated Students:** UT Tyler honors the service and sacrifices of our military-affiliated students. If you are a student who is a veteran, on active duty, in the reserves or National Guard, or a military spouse or dependent, please stay in contact with me if any aspect of your present or prior service or family situation makes it difficult for you to fulfill the requirements of a course or creates disruption in your academic progress. It is important to make me aware of any complications as far in advance as possible. I am willing to work with you and, if needed,



put you in contact with university staff who are trained to assist you. Campus resources for military-affiliated students are in the [Military and Veterans Success Center \(MVSC\)](#). The MVSC can be reached at MVSC@uttyler.edu or via phone at 903.565.5972.

**Academic Honesty and Academic Misconduct:** The UT Tyler community comes together to pledge that "Honor and integrity will not allow me to lie, cheat, or steal, nor to accept the actions of those who do." Therefore, we enforce the [Student Conduct and Discipline policy](#) in the Student Manual Of Operating Procedures (Section 8).

**FERPA:** UT Tyler follows the Family Educational Rights and Privacy Act (FERPA) as noted in [University Policy 5.2.3](#). The course instructor will follow all requirements in protecting your confidential information.

**COVID Guidance:** The UT Tyler community of Patriots respects the rights of others to wear a mask if they desire to do so. COVID guidelines may change as the situation warrants, and students should follow the instructions warranted by the situation.

**Absence for Official University Events or Activities:** This course follows the practices related to approved absences as noted by the Student Manual of Operating Procedures ([Sec. 1 -501](#)).

**Absence for Religious Holidays:** Students who anticipate being absent from class due to a religious holiday are requested to inform the instructor by the second class meeting of the semester.

**Campus Carry:** We respect the right and privacy of students who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>.