Data Management
NURS 6320
Fall 2025

Scheduled Class Days and Times: Online

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Office Hours: Virtual Office Hours: Wednesday 7:30pm to 8:30pm CST and available via appointment, email, phone, and/or Zoom. Please feel free to contact the instructor anytime for any course related questions. If you don't hear back a response within 48 hous during the weekdays, please contact the instructor again.
* Best way to contact me. Texting is always okay if you need immediate assistance. Please make sure to include your name and the course number in your text message.

This course provides an introduction to data management principles and practices tailored to Nursing PhD students with little to no prior experience in data science. The course aims to equip students with the foundational knowledge and skills necessary to effectively manage and manipulate data in nursing research settings. Topics covered include data collection methods, data cleaning and preprocessing, database concepts, and preparing data for statistical analysis. Through hands-on exercises and projects, students will gain practical experience with data management tools and techniques applicable to their future research endeavors.

Philosophy: Shift focus from *manual execution* (e.g., coding, formula building) to *critical thinking, interpretation, and application of AI-assisted workflows*.

Prerequisites: NURS 6310

Student Learning Outcomes:

Upon successful completion of this course, the student will be able to:

By the end of this course you should be able to:

1. **Understand data structures and database fundamentals**, including matching and merging multiple data files.

2. **Manage and screen datasets** by identifying variable properties (e.g., scales of measurement), evaluating sample distributions (e.g., normality), identifying errors and data cleaning process.

3. **Apply data collection theories and methods** relevant to nursing and health research.

4. **Obtain, summarize, and interpret sample characteristics** using descriptive statistics (e.g., central tendency, variability, distributional patterns).

5. **Demonstrate knowledge of relational database concepts** and develop fundamental skills to construct and run queries.

6. **Evaluate and test hypothesis/statistical assumptions** underlying descriptive and inferential analyses **using data analytic software (e.g., SPSS, Excel, Access)** .

7. **Work with both primary and secondary research datasets**, recognizing unique challenges and opportunities of each.

8. **Critically engage with AI as a collaborative tool** for data-related tasks, developing the ability to interpret, validate, and ethically apply AI-generated outputs.

Required Textbooks and Other Tech account:

AI Notebook / Page (Required)

- Select a **general-purpose generative AI platform** of your choice (e.g., ChatGPT, Microsoft Copilot, Google Gemini).

- Create a dedicated **Project (ChatGPT) or Page (CoPilot)** in your chosen AI platform to serve as your **documentation notebook** for this course.

- Use this notebook to record prompts, AI outputs, reflections, and critical evaluations of AI-assisted work throughout the semester.

- Note: Some platforms may require a **paid account** to access advanced features used in this course.

Textbook

The course is designed around **practical, hands-on skills** in data management and analysis, with content updated each semester to incorporate the **latest technology and AI-enhanced practices**. Since no single textbook fully covers the range of competencies required, students are expected to **follow the module content and AI learning guidelines** as the primary resources. Please contact the instructor if you have any difficulties to follow the course contents.

- [Becoming a Data Head: How to Think, Speak, and Understand Data Science, Statistics, and Machine Learning](#)

- [SPSS Survival Manual: A Step by Step Guide to Data Analysis Using IBM SPSS](#)

(Helpful if you prefer traditional step-by-step instructions rather than relying on AI-assisted guidance)

- Keet, T. (2022). *Excel 2022: The Ultimate guide to master Excel features & formulas. Become a pro from scratch in just 7 days with step-by-step instructions, clear illustrations, and practical examples. (Useful if you prefer traditional coding and formula-building in Excel; optional if using AI tools for these coding tasks).*

REQUIRED SOFTWARE

The most recent version of SPSS: Statistics package for the social sciences.

Microsoft office 365- Excel

IBM® SPSS® Statistics **Premium** GradPack 29 (6 and 12 month licenses available at http://www.onthehub.com/spss/) You will use this software throughout the program, so you may want to consider the 12 month license. (DO NOT purchase the basic package; it does not have all the functionality you need for course work).

Grading Components

Quizzes (5) –20%
- Short online assessments based on assigned readings and course materials available in Canvas.

Data Assignments (5) - 50%
- Mini assignments focused on data tasks.
- Submit documentation and present outputs as part of each assignment.

Discussions (4) - 10%
- Engage in course discussions to demonstrate understanding and application of concepts.

Data Management Project – 20%
- Follow the provided instructions and template to create a research data management and analysis plan.
- Use SPSS (or another approved program) to describe your sample and conduct simple analyses.
- Prepare a video presentation summarizing your project.

Assessment Methods	Percentile
Quizzes (4)	20%
Data Assignments (5)	40%
Discussion (4)	15%
CITI Training	5%
Data Management Project	20%
	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.

All couse 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 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:

Description of Assessment Methods
Quizzes (4) short online assessment of learning based on readings and course materials provided in Canvas.
Data Assignments (5) data tasks, documentation and present output in mini assignments.

- One ongoing AI assistance discussion board that runs throughout the semester.
- Three additional discussions embedded within course modules.

Data Management Project –
- Follow the provided instructions and template to create your research data management and analysis plan.
- Use SPSS or another approved program to develop your data collection tool and data dictionary.
- Prepare a video presentation to share your research findings.

Calendar of Topics, Readings, and Due Dates:

WEEK	CONTENT	READINGS	ASSIGNMENT/DUE
Wk. 1: 8/25	**Start with Critical Thinking** • Overview the software and platforms for data management • Understand coding /syntax • Introduce ChatGPT /Copilot	Chapter 1 and Chapter 3	Discussion 1 Board 9/2
Wk. 2: 9/3	**Introduction to Data Management** • Overview of data management • Introduction to data types and formats • Understand data components • Data dictionary and cood book	Gutman Chapter 2 Excel Chapter 2 and 3	Assignment 1 Data Dictionary 9/11
		Census Date	9/8
Wk. 3: 9/10	**Ethical Considerations in Data Management** • Privacy, confidentiality, and security issues • Informed consent and data sharing • Institutional review board (IRB) requirements	GutMan Chapter 4 CITI Biomedical Investigator Course	Complete CITI Training online 9/18

Wk. 4: 9/17	Data collection • Overview of data collection methods (surveys, interviews, observations, etc.) • Understand Data collection bias • Understand sample size estimation • Best practices for ensuring data accuracy and reliability	Gutman Chapter 4 Excel Chapter 4, 5, 7, 14	Quiz 1 – 09/22
Wk. 5: 9/24	Data Cleaning and Preprocessing Identifying and handling missing data Outlier detection and treatment Data validation and quality assurance	Gutman Chapter 4 Excel Chapter 11, 13	Assignment 2 Clean the data file using Excel 10/6
Wk. 6: 10/1	Data Visualization and Exploratory Data Analysis (EDA) • Understanding the distribution Outliers and extreme outliers • Detecting patterns and relationships • EDA techniques using statistical software Importance of data visualization • Choosing appropriate visualization techniques • Hands-on practice with data visualization tools	Gutman Chapter 6 Excel Chapter 8, 9, 13	Quiz 2-10/13

Wk. 7: 10/8	Longitudual Data and Repeated Measurements • Data structure and format • ID system and De-identify data file • Fomula in Excel •	Online Excel chapter 17, 18	Assignment 3 EDA and Data visualization using Excel 10/20
Wk. 8 : 10/15	Introduction to Databases • Basics of relational databases • Structured Query Language (SQL) fundamentals • Designing database schemas for nursing research	online course	Due to the relevant contents in these two modules, both Quiz 3 and Assignment 4 DBMS Exercise using Access due on 10/30
Wk. 9: 10/22	Database Management Systems (DBMS) • Overview of popular DBMS (e.g., MySQL, PostgreSQL) • Installing and configuring a DBMS (Access) • Managing databases and tables and creating queries using Access	Online	
Wk. 10: 10/29	Search for hidden groups • Recognize "hidden groups" as underlying structures or patterns in data that are not immediately obvious. • Use Principal Component Analysis (PCA) for dimensionality reduction • Apply Clustering methods	Gutman Chapter 8	Discussion 2 - Midterm Reflection 11/6
Wk. 11: 11/5	Understand Regression • Explain regression as a statistical method for modeling the relationship	Gutman Chapter 9	Quiz 4 - 11/13

		between a dependent variable and one or more independent variables. • Introduce different regression tests • Introduce path analysis. • Introduce Structural Equation Modeling (SEM)		
		Last day to drop with	11/6	
Wk. 12: 11/12	Understand Classification model • Explain how to use logistic regression for classification. • Introduce decision trees for non-parametric classification.	Gutman Chapter 10	Assignment 5 Analysis using SPSS 11/20	
Wk. 13: 11/19	Understand Text Analytics • Explain key components of text analytics • Introduce text analytics techniques • Use visualization tools to generate word cloud	Gutman Chapter 11	Discussion 3 –Data preparation and Analysis 12/2	
11/27 - 11/31	THANKSGIVING BREAK			
Wk. 14: 12/2	AI and Deep Learning • Introduce artificial neural networks • Introduce Artificial Intelligence (AI), Machine Learning, and, Deep Learning • Introduce applications of deep learning	Gutman Chapter 12	Data Management Project – Parts I & II (presentation) 12/9	

School of Nursing Policies and Additional Information:

https://www.uttyler.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 (Links to an external site.) 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.